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ART. I. *Character of Italian and Grecian Architecture.* By CANDIDUS.

IN my last article (p. 245.), I mentioned some of the opinions of Mr. Hosking with regard to Palladio and his school; and I shall now enter a little into detail respecting the faults of Italian architecture.

One marked and radical vice of the architects of the Italian school consists in their overloading their compositions with extraneous embellishment, frequently in the most vicious and paltry taste; while they wilfully reject the more legitimate sources of architectural *richness*. Columns are seldom fluted, still more rarely are friezes sculptured, even where the architects seem to have laboured to bestow as much finery as possible. Notwithstanding, too, their excessive love of pediments, they seem quite insensible to the real value and beauty of that feature, debasing it not only by the most *outré* shapes, but by the most absurd application. Pediments have been sometimes applied even to windows placed in an attic, than which nothing can be more uncouth, as well as preposterous; nor is it much more tolerable to behold, as in some of Palladio's designs, statues placed on the raking cornices of pediments, above the principal windows. I cannot undertake to enumerate here the various other abuses which Mr. Hosking has not pointed out, or the sins of omission he might justly have laid to the charge of Italian architecture; suffice it, therefore, briefly to observe, that it is, for the most part, at once mannered and capricious; that it displays more heterogeneousness than variety; that it mistakes baldness for simplicity, frittering for richness; and that it is too much addicted to a certain triviality, even where it affects magnificence; and is, consequently, more pompous than dignified.

I shall, perhaps, be reminded that I ought to speak with more distrust of my own judgment, and pay some deference, at least, to long established taste; for what has obtained such general

approbation must, of course, possess considerable merit. The admirers of Italian architecture themselves cannot, however, very well quarrel with me upon that score; because they have had no such misgivings when they passed sweeping and most contumelious censure on all the immediately preceding styles of the art; although the latter ought to have been exempted from their reproaches, if general consent is to be taken as presumptive of desert. Without giving themselves the trouble to enquire how far other styles, based upon different principles than those which regulate a columnar system, are capable of producing effect by conforming to such principles, they cut the matter short, by condemning them *in toto*. I, on the contrary, object to Palladian, or Italian, architecture, that, professing not merely to be founded upon, but to be essentially the same as, the system observed by the ancients, at least, wherever it employs similar features, it nevertheless tolerates practices the most repugnant to it; and only approaches to it in such manner as invariably to remind us of its dissimilitude, and of its inferiority to the other. I am now speaking of this style as it showed itself in its most palmy state, and as it was practised by those who are looked up to as the greatest masters in it; nor do we say that, in itself, it ought to be charged with all the vices and caprices which have been engrafted upon it. When purified from such defects, it has some claim upon our favour; yet it must chiefly be when the orders are dispensed with, or, if any, only the Corinthian employed; and, if we may form any prognostic from one or two very recent examples, there seems to be an inclination just now to abandon strictly Greek models, and to revert to Italian architecture; greatly sobered, however, and divested of its most offensive characteristics. The Travellers' Club House, Goldsmiths' Hall, and the new City Club in Broad Street, are all decidedly Italian in character, in composition, and in detail. The last-mentioned is, perhaps, the most strikingly so, on account of its Doric order in pilasters, its heavy consol cornice, and the curved and triangular pediments placed alternately over the windows, together with the fancifully carved armorial shield, introduced in the pediment of the centre window. Little as I desire to see even such a modified and reformed Palladianism gain ground among us, I admit it to be preferable to that most bastard of all styles (if style it may be called), which gives us bits and patches of Greek architecture, stuck up *en appliqué*, on spruce and dapper-looking houses. This shop-front method, excusable only in shop fronts, is the mere mockery of classical taste, and, in fact, the most arrant cockneyism. Architecture should not be made to deal in samples, or to make a show-board of the front of a building, for the purpose of displaying mere detached specimens, that may be

studied either in the plates of Stuart, or any of the numerous copies from them.

This brings to my recollection that I have as yet done little more than show Mr. Hosking's anti-Vitruvianism and anti-Palladianism, and that I may also exhibit one or two of the opinions he entertains in regard to Greek architecture itself. Before he proceeds to treat of the orders employed in it, he questions the propriety of the term *order*, as being hardly sufficiently comprehensive, and as conveying the idea of "restricted forms and proportions." But I had better let him speak for himself on this point; and the following extract will at once give an idea of the tone and spirit in which he handles the subject: — "There is nothing in any one 'order' that, were it not for custom, would not be thought as fitting in any other, as in that to which it may belong. The Greeks did not hesitate to put triglyphs in the frieze of an entablature the columns of which were fillet-fluted, and had foliated capitals, as some ruins at Pæstum attest. As to names, the Doric might, as we have said, be called Corinthian with more propriety; the Ionic, Samian; and the Corinthian, Athenian; referring to the oldest known examples of each. The term *style* would be more correct than *order*, as it would indicate the column as the feature referred to, without conveying the idea of fixed rules; and architectural works into which columns do not enter need not be constrained to admit the arrangement of some order in the composition, proportion, and detail of its various parts. In naming, too, the Doric might be termed the Greek sacred, or triglyphed, style; the Ionic, the voluted style; and the Corinthian, the foliated; thus admitting any varieties of combination which could be expressed as composites of the voluted and foliate, or of the foliate and triglyphed, as the case might be."

All this will, of course, be considered by many as wofully unorthodox and latitudinarian; and will be deprecated, as tending to unsettle what so much pains have been taken to settle with the utmost nicety. Alas! for the gentry of the "ruler and compasses" school! who are thus turned adrift to shift for themselves, without either rule or compass to steer by. Mr. Hosking's "styles" must disorder them and their orders completely. As regards my own particular self, I own I am less *particular* upon the subject; and that I am very ready to accept this doctrine under certain limitations. I certainly do not see what is to be gained by merely disturbing names which have now obtained universal currency and a definite meaning: it matters little whether columns with foliaged capitals be termed Corinthian or Athenian; even admitting the latter epithet to be historically more appropriate as respects their origin. It would, on the contrary, be a very influential improvement; and one attended

with little or no inconvenience at first, were we to adopt the term "style," when mentioning in general terms the Doric, Ionic, &c., and employ that of "order" in a more restricted sense; namely, to distinguish the leading varieties of the same style. Thus, we might properly enough speak of the Ilyssus, or the Erechtheum order, as contradistinguished the one from the other, or from other modes of the Ionic, or voluted, style: and in the same way we might define with tolerable precision, as well as brevity, the principal orders of the Corinthian style; whereas, at present, the term "Corinthian" is exceedingly vague and indefinite; comprehending, as it does, so many subordinate varieties, agreeing only in the circumstance of the capitals being foliaged, but differing in nearly every other particular. It is not, however, for the sake of greater precision and convenience alone that I would recommend this change in the vocabulary of the art; but because it would directly tend to do away with many impertinent and enfeebling prejudices, that are instilled into the mind of the student, even with the very elements of his education. Another and very important service would be, that, instead of being restricted to one uniform character, or to any fixed proportions, one and the same style would admit of much variety of expression; and that the different orders comprised in it may vary considerably in their proportions.

In regard to the other opinions expressed by Mr. Hosking, I think that, although there are some things, the exclusive application of which to any one order or style in particular has little more than custom and conventional propriety in its favour, there are others which do not admit of being arbitrarily rejected or adopted. Were such not the case, it must follow, that there is really no other propriety in any of the ornamental parts of architecture, than what habit has assigned to them. Now, even I, who may probably have fewer prejudices and scruples than most of my neighbours, cannot go quite so far as this; because, at that rate, we must admit that a column with either a voluted or foliaged capital might dispense with a base, and might have its shaft fluted after the Doric fashion. Yet it is obvious that these differences between the latter style and the two former are not merely conventional, but result from real differences of *style* itself. It is not because a column is so many diameters in height, that it is to be fluted according to this or that manner, to have a base, or the contrary; but, if for any valid reasons at all, for very different ones. In the voluted and foliaged styles, the capitals of which are so much more delicate and ornate, mouldings for the bases of the columns become necessary; not on the whimsical pretence assigned by Vitruvius, but to produce consistency of character and harmony above and below; and, likewise, for the purpose of rendering the foot of the column of

such diameter as shall make it correspond pretty nearly with the greater diameter of the capital, as otherwise the column would seem top-heavy. In the Doric column, the agreement is obtained between the two extremities in a different way: the column is, in fact, as wide above as below; that is, taking its echinus as its upper diameter; for the expansion of the capital is occasioned only by the contraction of the upper part of the shaft and the hypotrachelion. In the voluted style, on the contrary, the average width of the face of the capital is one half more than the lower diameter of the shaft, and, consequently, requires to be counterbalanced by a base. The problem, it is true, might be differently solved; we might, for instance, get rid of the base by increasing the lower diameter to the proportions assigned to that member: yet this would be nothing more or less than shortening the column; and, as it would require to be tapered accordingly, would be only placing a Doric shaft beneath a voluted capital. In like manner, the mode of fluting is neither exactly arbitrary, nor is it merely habit which recommends arrise-fluting for the Doric, and fillet-fluting for the other two styles. Consistency of character, without which there can be no style, demands it. In the Doric, which is marked by breadth, and by lines and plane surfaces, shallow flutings, forming arrises, or ridges, on the general face of the shaft, harmonise with all the rest, and serve to carry on the leading expression; but such flutings would be utterly at variance with the curved mouldings of different kinds employed in the other styles. They would look poor and harsh when brought into contrast with the spirals of the Ionic capital, and the tori of the base. In order to make them accord with these, and to keep up harmony between the concavities and convexities, they must be made deeper, and their sections be made to describe fuller curves; and, as they must, of course, be narrower, they must be increased in number, and have spaces, or fillets, left between them. By these means the whole shaft acquires admirable delicacy and richness, owing to the greater number and depth of the shadows, as well as to the effect of the intervening fillets, which are necessary, if only to balance by their light the quantity of shadow.

Among those things which custom appears to have arbitrarily appropriated to a particular style, are the triglyphs of the Doric frieze; for, according to the so long received opinion, that these members had their origin in a prototypic timber construction, and represent the ends of the beams of the roof, they would be equally suitable for, or rather indispensable in, every style of Grecian architecture. It is for those who maintain this theory to show wherefore triglyphs, or something corresponding to them, should not be employed in Ionic and Corinthian friezes,

just as the same system of entablature is observed in all the orders, although differently modified. Although the Doric triglyph partakes so strongly of the general character of that style, as to be unfitted for any other (and, even were not such the case, it would hardly be advisable to apply indiscriminately what has hitherto been a distinctive mark of a particular style), I am of opinion, that the hint just thrown out is not altogether undeserving attention, and that some analogous ornament might occasionally be applied to Ionic and Corinthian friezes. At present, let every other part of a building in either of these latter styles be ever so highly finished, the frieze is almost invariably left quite plain. Hence there is a poverty of effect, and an evident falling off here, in many otherwise *exact* imitations of Greek architecture. While they slavishly copy Greek entablatures in their minutest details, our architects seem entirely to forget that in the originals the frieze was generally enriched with sculpture; consequently, if this is omitted, greater embellishment must be bestowed elsewhere. In consequence of their not attending to this circumstance, the cornices of most of our modern Ionic examples have a meagre shelf-like appearance, quite out of keeping with the columns themselves, although such a cornice was sufficient when it was desirable to keep it somewhat subordinate to the sculpture immediately beneath it, and which imparted sufficient richness to the whole upper line of the structure. Either the cornice itself ought to be rendered a more efficient feature in the design, by giving it greater depth, and additional mouldings; or, if continued sculpture must be dispensed with, ornament of some kind should be applied to the frieze. The deservedly admired little Ionic chapel in North Audley Street is indebted for much of its merit and beauty to its cornice, which, besides being dentiled, is otherwise much enriched, and has altogether a *boldness* that forms a striking contrast to the *baldness* and insipidity of some other *soi-disant* pure Greek examples among us; a boldness by no means misplaced; for, notwithstanding its richness and delicacy, the Athenian Ionic capital is particularly bold in its volume and outline. With the view of explaining what has been said in regard to embellishment for the Ionic frieze, I may here mention that I have lately seen a design, where, among other novelties in the composition (Ionic), the frieze is ornamented with tablets, or blocks, following nearly the proportions and arrangement of triglyphs, but sculptured with rich voluted scrolls, similar to those upon Ionic *antefixæ*, or eaves-tiles, and, of course, sufficiently in character with the rest of the order. I may also observe here, that these remarks on the Ionic frieze apply, in some degree, to the Corinthian; at least, in such examples as the Tivoline order, which may be seen in the Bank of England,

both with a plain and sculptured frieze. The difference of effect, therefore, may be readily determined; and, on comparing them, it will at once be perceived that the omission of the sculpture (all the rest being kept the same) gives quite a different character to the order, causing the columns to predominate, and their capitals to appear heavy, while the entablature becomes comparatively insignificant. Perhaps it was in order to counteract this, in some degree, that the architect introduced so many blocks and ornamental scrolls on the upper line of the edifice.

I have perhaps erred in supposing that Mr. Hosking intends the first sentence of the passage quoted in p. 339. to be taken exactly *au pied de la lettre*; for I can hardly imagine him disposed to sanction such incongruities as I have pointed out; or to mean that the different modes of fluting, &c., would serve just as well for one style as another, were it not that custom has determined otherwise. If he means no more than that, by *a skilful accommodation to the character of the style* to which it is transferred, much that is now considered the exclusive property of one order may be applied to another, I most cordially agree with him. I have already hinted that, excellent as I consider Mr. Hosking's treatise upon the whole (and I am so well pleased with it, that I only regret his limits should have prevented him from doing more than briefly touch upon many points he seems well qualified to discuss), there are some few opinions in which I certainly do not concur with him. Among these is his condemnation of Caryatides, or, as they might more properly be styled, *anthropostylar* figures. Not content with objecting to them, except under peculiar circumstances, he even goes so far as to term them "a solecism in architecture." That they may be employed in a tasteless and absurd manner, I do not deny; but that they are in themselves contrary either to reason or strict architectural propriety, I cannot admit. What can be more preposterous, I have heard it urged, than to see females supporting a heavy entablature? This may be excellent as gallantry, and unexceptionable as common sense: still I must be excused from thinking it good criticism; for, if art is to be tied down to plain common sense, we must henceforth withdraw our admiration from many things upon which we now bestow it. The common sense, however, of such objectors is exceedingly short-sighted, and one-sided. If it be absurd, in one particular case, to represent human figures doing that which real human beings cannot do, it is no less so in every other. Why, then, if our sensibilities are so disagreeably worked upon at beholding ladies sustaining the weight of an entablature, and performing the office of columns, are we not equally shocked when we behold the same delicate creatures compelled to stand on the top of a building, or fixed in niches, like a sentinel in his sentry-box, exposed to

burning sun or storm? Or why do we not turn giddy out of mere sympathy with the unfortunate hero who is destined to pass his days and nights, like Simeon Stylites, perched on the top of a column? Or, again, if reason and common sense are to be our guides, how can we for a single instant tolerate such a gross offence against both as meets our eyes in a bust, representing, not a death's head, but a living animated countenance, dissevered from its body? Common sense will, I apprehend, be hardly found to answer the purpose of those who found upon it their objections to Caryatic columns. The absurdity (if there be any at all) lies rather with statues introduced as accessories to architecture; for, being more natural in themselves, such application of them becomes still more unnatural; whereas an anthropostylar figure has (at least, ought always to have) a certain fixity, if I may so term it, and positive architectural character, which shall distinctly mark it for what it is. Attitudinising, *figuranti* Caryatides, I certainly should dislike quite as much as Mr. Hosking, or any one else; neither should I greatly admire them placed under a pediment, or serving as the sole order in a building; but, I confess, I am barbarous enough to be delighted with them when gracefully and picturesquely introduced; and if, in this instance, my judgment errs, my taste, at least, is consoled by being countenanced by the example of Athens.

To say the truth, I cannot help thinking that, both here and on one or two other occasions, Mr. Hosking is rather too straight-laced, rigid, and puritanical in his notions, notwithstanding the latitude he is ready to allow in regard to other points. Thus, in his section on horizontal composition, which, with the corresponding ones, forms a novel, and certainly very interesting, feature in a treatise like his, he lays it down as a maxim, that a portico ought not to be introduced, except it either occupies an entire side or end of the building against which it is placed, or is made a distinct portion of the façade, and elevated above the rest, as in the London University and St. George's Hospital. Now, in my opinion, a projecting portico, that is, one really advanced beyond the principal mass of the structure to which it is attached, which is not the case in a mere prostyle, produces great relief in a lengthened façade, and prevents the too great monotony, and also the too great similarity, in composition, which would take place were the use of the portico restricted, as Mr. Hosking recommends. The reason why the Greeks uniformly adhered to one disposition, and, in fact, notwithstanding the many 'hard words' employed to mark certain minor differences, the plans of all their temples are the same: the reason of this, I say, is obvious; their temples being merely simple oblong structures, like (let not the simile be thought a profane one) an English barn, having columns externally, either

at one or both ends, or on every side, and, consequently, such a kind of apartment as might very well be covered by a single roof. Our buildings, on the contrary, are more complex: they are divided internally by walls, which afford supports for the roof, and thus admit of its being formed into similar divisions, any one of which may, without impropriety, have its extremity fashioned as a gable, or pediment, just as we see gables employed in Gothic architecture. I do not say that an architect may not very easily err in regard to the employment of pediments; he must consult taste in this, as well as in other matters of composition: all that I would stipulate for is, that the pediment should actually be a part of the roof, and that its own roof should be seen to extend backwards, so as to cover that division of the building.

I may here take the opportunity of observing that, much as I admire the beauties of style in Grecian architecture, I certainly do not approve of that excessive simplicity of composition, and that rather wearisome sameness of arrangement and disposition, which mark nearly all the Grecian buildings; and which seem to have left little more for the architect to do than to determine the actual dimensions, and arrange what belongs to detail. In this respect, the Greek temples are like London houses: when you have seen one, you have seen nearly all; for all are laid out upon the same plan.

Mr. Hosking seems to value simplicity too exclusively: it is, undoubtedly, a very meritorious quality, but it is not the only one to be attended to; and, when it becomes nothing more than repetition, and we find precisely the same kind of simplicity presented to us again and again, we are disposed to recur to the stale saying of *toujours perdrix*. I dissent, therefore, entirely from the censure Mr. Hosking has passed on what I regard as one of the most interesting and valuable studies of Athenian architecture; namely, the triple temple in the Acropolis, which he objects to for the very circumstance that gives it so much interest in my eyes; namely, its irregularity, and its deviation from the usual form. He says, "It was completely spoiled by the attachment of a tetraprostyle to one of its sides; Ionic, certainly, like that in front, but of a different size; beautiful in itself, but a blot on the main building, with which it harmonises in no one respect." Now, I cannot help thinking that it did harmonise; while this collocation of two features, perfectly similar in style, although so different in some other respects, must have produced a delightful combination, with just such a dash of the picturesque, and of contrast, as to give an effect to each portion which neither would have possessed separately. It should be borne in mind, too, that, although both porticoes might be viewed from the same point, they faced different

aspects. At all events, as regards one very important quality in architectural composition, variety, exceedingly useful lessons are to be derived from it, and many more ideas than it seems at first capable of affording.

Elsewhere, again, Mr. Hosking strenuously dissuades architects from the adoption of irregular or intricate forms, as subversive of beauty; and by irregularity he does not merely mean want of uniformity, but such irregular combinations of plan as that of the Pantheon at Rome. By modern architects, this species of irregularity has frequently been carried too far; and they have sometimes pushed intricacy into confusion; for which I do not attempt to become their apologist. Yet it appears to me, that, if there is a vicious kind of intricacy, there is also its opposite: a kind of intricacy, or what appears at first sight to be so, which afterwards, when we come to examine more carefully, resolves itself into harmonious and skilful arrangement; and which, instead of affording a single effect, excites our curiosity, and detains our attention, by presenting a succession of them according as we change our point of view. It would be quite idle to attempt to lay down any definite precepts, either as to this, or other circumstances of a like nature; because it is at such points that precepts terminate; and it remains for the artist to determine, in each individual case, what all the other circumstances of his design point out as most eligible. Precisely is it in considering this rational liberty that anti-Vitruvianism consists. That such liberty will frequently be abused, is no more than what must be expected; nor do we see wherefore the architect should be condemned to walk in a "go-cart" all the days of his life, more than any other artists. Go-carts and leading-strings are very useful contrivances; but, were no one to be liberated from them, the world would behold no Taglionis.

ART. II. *On ancient Theatres and early Dramatic Entertainments.* By EDER.

THE drama, or its rude incipient representations, date long anterior to the day of Grecian eloquence and learning. Plays, or representations of historical events, were performed in Hindostan, China, and Peru, before they were known to the Greeks; and, as these countries could have had little communication with each other, it is evident that each of these people must have invented for themselves this species of amusement; the earlier dramas of each people having, probably, originated in the recital of the heroic deeds of their progenitors of former days; which became, in time, so altered and added to, from the defectiveness of oral transmission, that at length the coinage of the brain was

substituted for historical truth. The origin of the Grecian drama seems to have been the songs which were sung in honour of Bacchus at his festivals, which were held in every village; for which a goat (which, being considered injurious to the vines, was the animal usually sacrificed to Bacchus) was the reward; and hence the origin of the word tragedy, which is derived from *tragos*. In process of time, a regular chorus was formed; the singers habiting themselves in goat-skins, and wearing the horns of the goat; some representing satyrs, some Pan, and others Silenus; each of the performers carrying in his hand a thyrsus, or pike, with ivy leaves twisted round it, and wearing a crown of vine branches, or of some other tree consecrated to Bacchus, on his head; whilst some of the assistants dragged along goats to be sacrificed for the ravages they had committed among the young vines by browsing on them. The singers afterwards amused themselves by shouting hymns to the honour of Bacchus, by vociferous invocations, by screaming and yelling, by running through the woods, and over the mountains, imitating drunkenness, and by violent dancing and gesticulation. They bandied their coarse jests upon the follies and failings of each other, in terms of the most disgusting indecency, and excessive ignorance. A French historian, speaking of these festivals, justly expresses his surprise how a people so wise as the Greeks could tolerate such scenes; and quotes a description of them from Plato, who, he says, had seen the whole city of Athens drunk at once.

Such was the origin of the drama: but these festivals, though even at best but drunken "orgia," such being actually the name given to them, became at length modified in brutality, and improved by the recital of verses, &c.; and Thespis, who first added an actor distinct from the chorus, would come forward at these feasts, and from the cart in which he travelled from village to village, recite some extempore tale, or mythological story. A chorus, trained by himself in singing and dancing, then commenced; and Bacchic songs, and extempore narrations followed at intervals, until the rustic bystanders were tired.

Gradually the stories became the principal part of the amusement, and the songs adventitious appendages. Dancing accompanied the songs; and "hence," says Athenæus, "Thespis, Pratinus, Carinus, and Phrynicus were called dancers, because they not only used much dancing in the choruses of their plays, but they were common dancing-masters, teaching any body that had a mind to learn." Thespis lived about the 60th Olympiad; and is admitted on almost all hands to have been the inventor of tragedy, and Horace and Plutarch coincide in this opinion: but, by a few, Phrynicus, his scholar, is said to have been the inventor; for he dropped the absurdities of the original drama, and gave it a more becoming dignity, resulting from the em-

ployment of more elevated subjects, such as history, mythology, &c. It probably lies between both; this, as most other arts, not having been invented by any one person, but being gradually developed by successive improvers, until some master mind chisels each art into form, and leaves it perfect; the credit of the invention is then given to him, when that of merely perfecting it is his due.

The honour of the invention of comedy is given to Epicharmus and Phormus, and is said to have begun in Sicily 500 years B. C. Satyric plays were introduced soon after, and were a mixture of comedy and tragedy. This latter species of drama derives its name from the satyrs, and has no connexion with that kind of vengeful raillery, called satire. Poets generally added a satyric character to their plays, as it served to temper the gaiety of comedy, or to soften the gravity of tragedy. How far the poems of Homer might have influenced the drama cannot here be shown; as, according to Cicero, they were collected together, and arranged as we now see them, by Pisistratus or his sons, and spread throughout Greece before the age of Phrynicus; and Eschylus says that his tragedies were but "slices from the plenteous feasts of Homer." Eschylus made still further changes; he shortened the songs of the choruses, added a second actor, employed dresses, raised the stature of the actors by means of a very thick-soled shoe, called cothurnus, and made them wear masks, formed so as to increase the distinctness and power of their voices. Previously to his day, actors stained their faces with wine lees; and this was sometimes done even after the use of masks, as we find when Aristophanes wished to ridicule Cleon, no workman could be found bold enough to make a mask like Cleon's face: but Aristophanes himself came forward, with his countenance smeared with wine lees, to ridicule Cleon, and reproach him with receiving bribes, and embezzling the public treasures. Many more gradual improvements were made in this mimicry of human actions, until the genius of Sophocles and that of Euripides rent asunder the trammels, and purged the stage of the trivialities of former dramatists; giving the finishing stroke to the art by their productions.

With the Greeks, theatrical amusements constituted part of their religion, their dramatic representations being only held during the festivals of Bacchus, to whom all theatres were, at first, dedicated; though in after-days we find they were sometimes dedicated to Venus. These festivals, or Dionysia, as they were called, from Dionysius (Bacchus), were three in number, and were held in the spring of the year; they were called the Rural, the Lenea, from a word signifying a wine-press, and the Great Dionysia; which latter took place between our March and April, and to which all Greece congregated, it being the season

when the most important dramatic contests were held, and deputations from foreign parts received. These exhibitions were esteemed to be of such vast importance, that they were placed under the direction of the first municipal magistrates; the first archon taking upon himself the management of the contests at the Great Dionysia; and the second archon, called king archon, those of the Lenea. These archons selected the compositions of the competitors, the prizes being adjudged according to the opinion of five judges, appointed by them. To every poet who essayed, were given three actors chosen by lot, and a chorus. The training of a chorus was so important, that some one, called choragos, was chosen by his tribe for this purpose. Whoever among the choragi gained a victory, dedicated a monument, or tripod, to Bacchus; containing in a few words the names of the principal performers, and his own. Thus we find on the choragic monument of Lysicrates, at Athens: —

"Lysicrates of Kikyna, the son of Lisitheides, was choragos.
The tribe of Akamantis obtained the victory in the chorus of boys.
Theon was the performer on the flute.
Lysiades, an Athenian, was teacher of the chorus.
Evænetus was archon."

This monument was erected in the 111th Olympiad; i. e. in the days of Alexander the Great.

The following is one of three inscriptions from the choragic monument of Thrasyllus: —

"The people gave the games. Pytharatus was archon.
Thrasycles, the son of Thrasyllus, a Decelian, was agonothetes.
The boys of the tribe of Hippothoon gained the victory.
Theon, the Theban, performed on the flute.
Pronomus, the Theban, composed the piece."

The inscriptions show that this was given by the people, the former by the choragos Lysicrates.

Plays were always performed by the Greeks in the open day; and originally by the side of some gently rising hill; the spectators being on the acclivity, and the actors on the plain. The inconvenience of this was, however, soon perceived, and wooden structures were erected for the purpose; but these were, at best, temporary, and were sometimes dangerous, as was shown at a representation between the rivals Eschylus and Pratinus, when the whole theatre fell, burying hundreds in the ruins. This event caused the erection of more substantial edifices; and the first stone theatre in Athens was raised in the time of Themistocles. This was the archetype of numerous others erected in Greece; but it appears that stone theatres had been erected in the colonies long previous, as at Egesta, Cysthena, Syracuse, Agyrium, Tauromenium, Adria, and other places. The enormous number of theatres erected in Greece and Asia Minor, and the grandeur and extent of their remains, may well excite, first,

the wonder, and then the admiration, of the moderns, and show in high relief the wealth, the luxury, and the intellectual character of the vivacious Greeks. Wherever the wandering footsteps of the traveller carry him, there does he find these remnants of Grecian civilisation. At Miletus, there are the remains of a theatre, externally of marble, 457 ft. long; another at Hierapolis contains all its marble seats unremoved. Again he sees their huge forms thrusting themselves from the sides of the hills at Ephesus, Egina, Sardis, Telmessus, Alabanda, Cyzicus, Mylassa, and Megalopolis; one at Epidaurus, built by Polycletus; two at Laodicea; and numberless others in different parts of the country; but, according to Pausanias, none excelled that in the grove of Esculapius, at Ligurio, the remains of which still exist. The seats are of pink marble, and are 1 ft. 2½ in. high, with a breadth of 2 ft. 9 in., in which was a groove, where it is supposed wood was inserted, in order to prevent the feet of those who sat behind from touching the backs of those before.

The theatres of Greece were built on the side of a hill; by which means a considerable saving of labour and materials was effected, as the seats were excavated from the hill itself; and, if of rock, were merely polished, but if of earth, they were generally covered with stone slabs; though occasionally, in the earlier examples, the earth alone formed the seat. So general was this troglodyte mode of building theatres, that but three instances are known of their being built in a plain, two in Greece, and one in Asia Minor.

The plan of the ancient theatres may be said to be a semicircle, the circumference being produced a little at right angles to its chord, thereby forming a semicircle placed against a parallelogram. The circular part, being excavated from the hill, afforded seats for the spectators, and in Greek theatres was termed the koilon: the same part, in Roman theatres, was called cavea. The parallelogramic portion was the scene; and the semicircular interval between the seats and the scene was the orchestra, which was generally sunk into the earth 10 ft. or 12 ft. below the lowest range of seats. The seats of the koilon were divided by corridors, parallel with the circumference, termed diazomata by the Greeks, and præcinctiones by the Romans; and afforded the means of passing round from one end to the other. The upper part of the seats was surrounded by a portico, where, by some it is said, the women alone remained; but this, at least, could not have been always the case, as females were not allowed to become spectators of the comedies, and, during sudden storms, the whole audience hurried to the portico for shelter. This portico seems to have been the resort of courtesans; and we learn they always paid a certain sum for their admission: for it appears their society was much more

courted than might at first be supposed; arising from the superiority of their manners and acquirements over those of the more virtuous matrons, who were treated with the greatest indifference, and were always rigorously confined to the house. So great were the acquirements of some of these frail fair ones, that it is related, that even the grave and learned Sophocles did not esteem it beneath his dignity to share with Pericles the favours of the beautiful Aspasia, and learn love and philosophy at her feet.

The seats were again divided from top to bottom by stairs, radiating from the orchestra, and dividing the seats into wedge-shaped masses, called kerkides by the Greeks, and cunei by the Romans.

The Greek orchestra was considerably larger than that of the Romans; as with the latter no part of the drama was acted in it, but it was appropriated to the senators, it being but 5 ft. below the stage, or pulpitum. It was quite otherwise with the Greeks, who required a larger space for the solemn dances which accompanied the flutes, and the songs of the choruses, when the performers passed slowly across, during the strophe, from left to right, returning during the anti-strophe, and stopping at the epode, in front, between the thymele and the scene. The name of the orchestra is derived from the Greek word signifying to dance. The thymele seems to have been an altar, placed nearly in the centre of the orchestra, on which sacrifices were made, and which was dedicated to Bacchus; but it seems, also, to have been used as a seat for the chorus, during the performance, when their assistance was not required. The chorus often separated into two or more parts, singing funeral dirges, and communicating to each other their hopes and fears, or dread of coming events; at other times, they sang of the follies and the failings of humanity, or their pity and admiration of the unhappy, or of those who courageously trusted to the gods, and bore up against what they religiously believed to be their destiny; and at other times they sang hymns to the gods, or sustained part of the dialogue with those on the stage.

Opposite the orchestra was the stage, or logeion, from *logos*, a word, or speech. This the Romans termed the pulpitum: it projected a little into the orchestra; and on this the performances took place. The front and sides of the stage were adorned with columns and statues; and in the centre was a double flight of steps, leading from the floor of the orchestra to the logeion, which was constructed of wood, to increase the power of the voice. Vitruvius relates that metal vases, regulated according to the chromatic scale, were placed in different parts of the theatre, under the seats, in order to reverberate the sound. Behind the logeion was the proscenium, which receded from

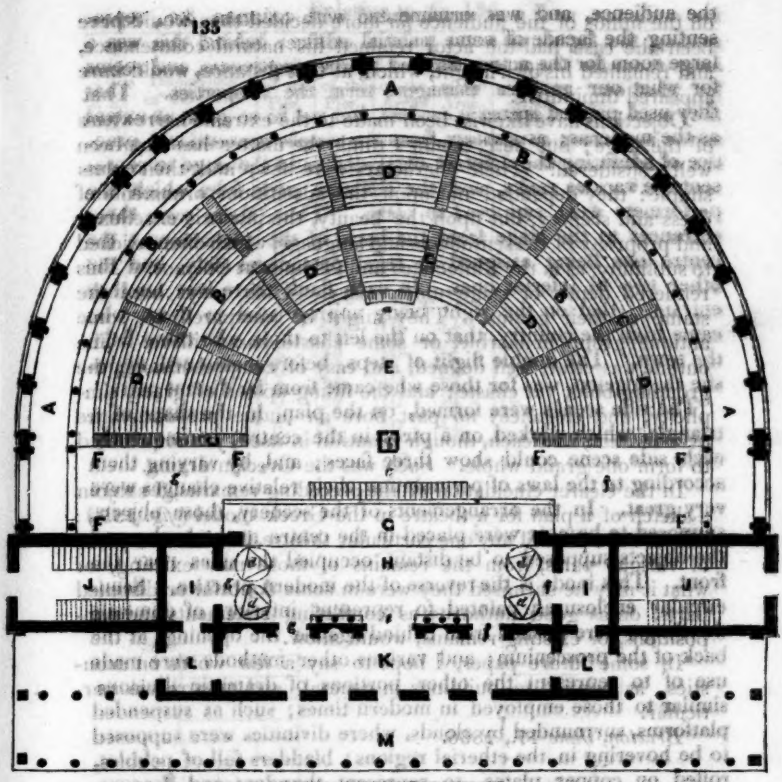
the audience, and was ornamented with columns, &c., representing the façade of some palatial edifice: behind this was a large room for the actors, flanked by dressing-rooms, and rooms for what our modern managers term the properties. That they used painted scenes is evident, but not to so great an extent as the moderns; as appears from the simple conventional practice of admitting the different entrances on to the stage to represent the various ranks, and the different parts from which the performers were supposed to come. Thus, there were three entrances to the stage from the back of the proscenium; the centre one being assigned to regal personages only, and the other two to inferior ones. In each flank there was another entrance; that on the right being appropriated to those who came from the country, that on the left to those who came from the town. The double flight of steps, before mentioned, opposite the logeion, was for those who came from far distant parts.

The side scenes were formed, on the plan, in the shape of a triangle, which worked on a pivot in the centre; consequently each side scene could show three faces; and, by varying them according to the laws of permutation, their relative changes were very great. In the arrangements of the scenery, those objects, supposed to be near were placed in the centre at the back; and the objects supposed to be distant occupied the sides near the front. This mode is the reverse of the modern practice. Semicircular enclosures, painted to represent interiors of domestic dwellings, were pushed from behind against the openings at the back of the proscenium; and various other methods were made use of to represent the other portions of dramatic illusions similar to those employed in modern times; such as suspended platforms, surrounded by clouds, where divinities were supposed to be hovering in the etherial regions; bladders full of pebbles, rolled on copper plates, to represent thunder; and beacons, towers, and fortresses, which were all contrived so as to produce their required effects.

Under the lower seats of the koilon was a staircase, on which the shades of departed heroes made their appearance before the terrified spectators: this was appropriately called Charon's staircase.

The rules of Vitruvius with respect to the mode of determining the relative proportions of the orchestra, proscenium, &c., are so imperfect, and, as is too often the case with him, generally so much at variance with existing remains, that I have not thought fit to insert them here; but the curious may consult him, and Julius Pollux, for further information on the subject.

The wearing of masks has been much objected to by the moderns against the Greek performers; but, I think, it is much to be doubted if their criticisms are just, or that the character-



A, Portico surrounding the upper part of seats. B, Diazomata, or corridors, to traverse round to different sides. C, Stairs from top to bottom. D, Kerkides, divided by the radiating stairs into the wedge shapes. E, Orchestra. F, Dromos. G, Logeion, or stage, where the performances usually took place. H, Proscenium. I, Property-rooms, &c. J, Staircases. K, Retiring-room, or saloon, for performers. L, Dressing-rooms, &c. M, Portico where the actors walked and rehearsed their parts. *a*, Charon's staircase. *b*, The thymele. *c*, Steps up to the logeion, for those supposed to come from distant parts. *d*, Side scenes working on pivots, and showing three faces. *e*, Entrance for royal personages only. *f*, Entrances for those who came from town. *g*, Entrances for those who came from the country.

istic good taste of the Greeks displayed itself less in this matter than in others. From the enormous extent of these edifices, the spectators were necessarily placed at a great distance from the performers, and, consequently, must have lost almost entirely those workings of the human countenance which often so vividly delineate the varying passions of the soul. But, by raising the height of the actors to the heroic size, increasing their bulk, and giving them masks with a strongly marked countenance, expressive of the character represented, an impression was formed

on the minds of the audience far more decided than would have been the case had the actor retained his natural countenance, and remained his own height, which, at that distance, would have appeared diminutive.

Objections have likewise been made to the extreme narrowness of the stage; but here, again, I think the matter has not been well considered. Their characters were few, and their plots simple: they depended not upon the adscititious ornaments of dress and scenery, but upon the beauty, the intrinsic excellence and propriety of the sentiments and language, which often reached to sublimity, as in the Philoctetes and Œdipus at Colonos. This rendered depth of stage unnecessary. Their plays bore the stamp of their genius. They might be compared to some antique group in marble, or some chaste basso-rilievo. The outline was clear, well defined, and easy of comprehension; the grouping bold, yet chaste; and the filling up full of grace, simplicity, and elegance: no part bore an undue preponderance over another, and each, though beautiful in itself, yet contributed to form one grand whole. Such was the Grecian drama.

In the clearer elucidation of the preceding remarks, I subjoin a sketch of a plan for a theatre in the Greek model (*fig.* 135.): it is not the plan of any one particular theatre, but it is composed of various parts, from the remains of those now existing, or what it may be surmised they were in some doubtful or disputed parts, on as good authority as conflicting statements and suppositions, or existing remains, would allow.

In some future paper, I hope to say a few words on acoustics, as applied to buildings in general, and theatres in particular.

Brixton, June 17., 1836.

ART. III. *Experimental Essays on the Principles of Construction in Arches, Piers, Buttresses, &c.* By WILLIAM BLAND, Esq. Essay IV. 1. *Experiments with Arches placed on Piers, having Weights and Structures upon them.* 2. *Experiments with Piers that will just balance under the Lateral Force and Weight of different Arches.* 3. *Experiments with Arches of varied Span and Form, acting against each other, being placed on Piers of unequal and equal Heights.*

FIRST, of Arches on Piers, &c.—The scale employed in the following diagrams is one eighth of an inch to an inch; and the wooden voussoirs and bricks are of the same dimensions as those specified in the preceding essays under the same title. The results of the first experiments with *figs.* 136. and 137. are as follows:—

Relative to *fig.* 136.

No. of Experiment.	Dimensions of the Pier.	Height of the Pier.	Weight of the Pier.	Span of the Arch.	Weight of the Arch.	Balancing Weight on the Arch.	Total Weight on the Top of the pier, being half the Arch and the Weight placed on it.
1	4 in. by 4 in.	18 in.	$4\frac{1}{2}$ lb.	10 in.	$4\frac{1}{2}$ lb.	$\frac{1}{2}$ lb.	$2\frac{1}{2}$ lb.
2	4 ... 4	15	$3\frac{3}{4}$	10	$4\frac{1}{2}$	$\frac{3}{4}$	$2\frac{5}{8}$
3	4 ... 4	12	3	10	$4\frac{1}{2}$	$1\frac{1}{2}$	3
4	4 ... 4	9	$2\frac{1}{4}$	10	$4\frac{1}{2}$	$3\frac{1}{4}$	$3\frac{7}{8}$
5	4 ... 4	6	$1\frac{1}{2}$	10	$4\frac{1}{2}$	7	$5\frac{3}{4}$
		Relative to *fig.* 137.					
6	6 ... 4	18	$6\frac{3}{4}$	10	$4\frac{1}{2}$	3	$3\frac{3}{4}$
7	6 ... 4	15	$5\frac{5}{8}$	10	$4\frac{1}{2}$	$5\frac{1}{4}$	$4\frac{7}{8}$
8	6 ... 4	12	$4\frac{1}{2}$	10	$4\frac{1}{2}$	7	$5\frac{3}{4}$
9	6 ... 4	9	$3\frac{3}{8}$	10	$4\frac{1}{2}$	14	$9\frac{1}{4}$
10	8 ... 4	6	3	10	$4\frac{1}{2}$	*	...

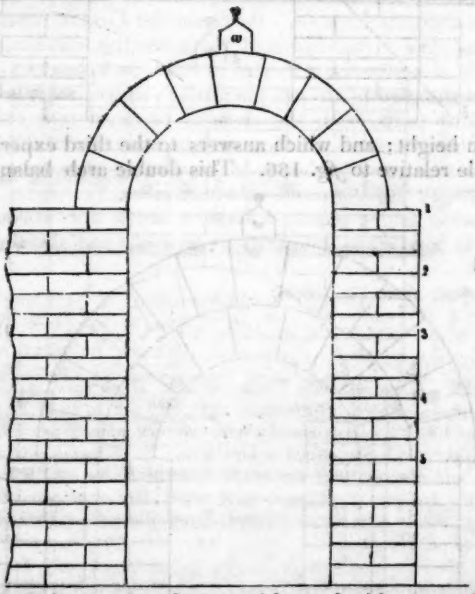


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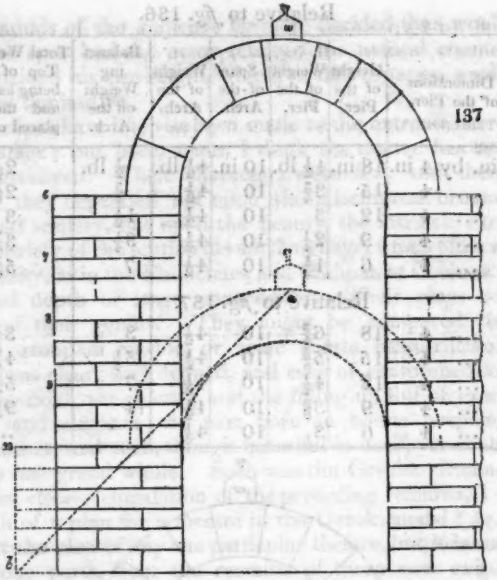
Fig. 138. is an experiment with a double voussoir arch, placed on a pier, the base of which measures 4 in. by 4 in., and

* The result here was, that the arch carried my weight (a weight equalling 147 lb.), because a straight line could be drawn from the weight at *a*, through the voussoir and pier, to the ground *b*.



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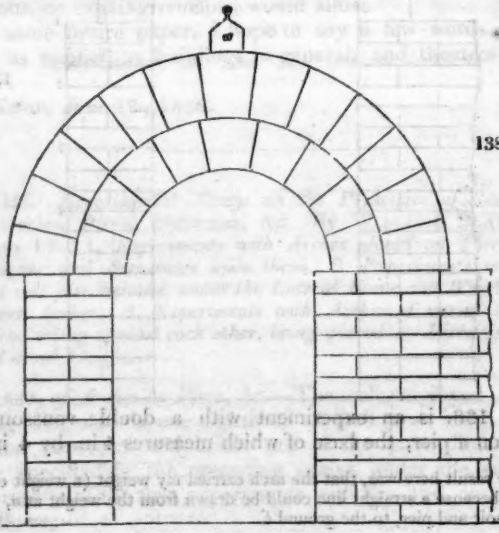
21 in. in height; and which answers to the third experiment in the table relative to *fig.* 136. This double arch balanced with



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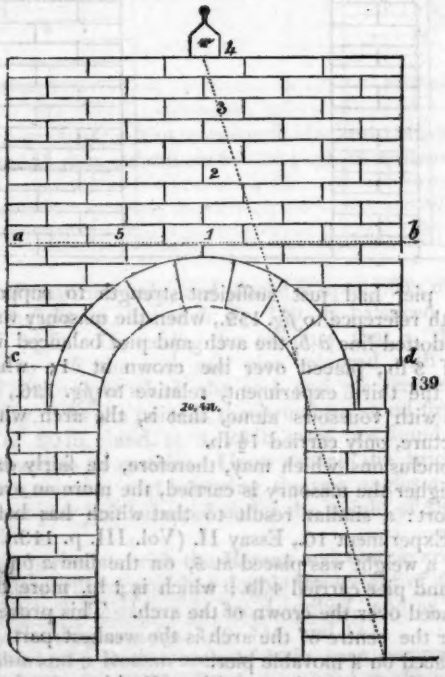
1½ lb., as in Experiment 3. (*fig.* 136.), under the single arch; consequently, proving the effects of both, as respects lateral force, to be the same.

Figs. 139. and 140. are experiments with arches on piers having superstructures raised on them; the following are the results: —

Relative to *fig.* 139.

Weight placed at the Numbers, as under.	Courses above the Crown of the Arch.	Weight of Bricks above the Arch.	Weight placed on the Bricks.	Total Weight of Superstructure, and the Weight on the Bricks.	Observations.
2	3 courses.	3⅝ lb.	6 lb	9⅝ lb.	The arch sustained this weight well.
3	6	7½	9	16½	With this weight, also, it carried all firmly.
4	9	11½	28	39¼	With this weight it carried all without yielding; and, therefore, could have borne considerably more.



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After removing the angles of the masonry, as shown in the diagram *fig.* 140., and replacing the weights as before, the

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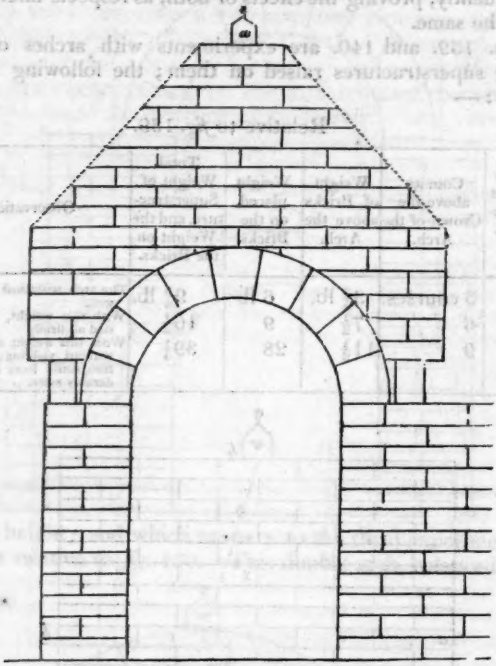

arch and pier had just sufficient strength to support 14 lb. Again, with reference to *fig.* 139., when the masonry was carried up to the dotted line *a b*, the arch and pier balanced under the weight of 3 lb., placed over the crown at 1; whereas, as shown in the third experiment, relative to *fig.* 136., the arch and piers with voussoirs alone, that is, the arch without any superstructure, only carried 1½ lb.

The conclusions which may, therefore, be fairly drawn are, that the higher the masonry is carried, the more an arch or pier will support: a similar result to that which has before been given in Experiment 10., Essay II. (Vol. III. p. 113.)

When a weight was placed at 5, on the line *a b* (*fig.* 139.), the arch and pier carried 4 lb.; which is 1 lb. more than when it was placed over the crown of the arch. This proves that the point over the centre of the arch is the weakest part, when the arch is placed on a movable pier.

Fig. 141. is an experiment with a Gothic, or pointed, equilateral arch, sustaining a superstructure. Having constructed

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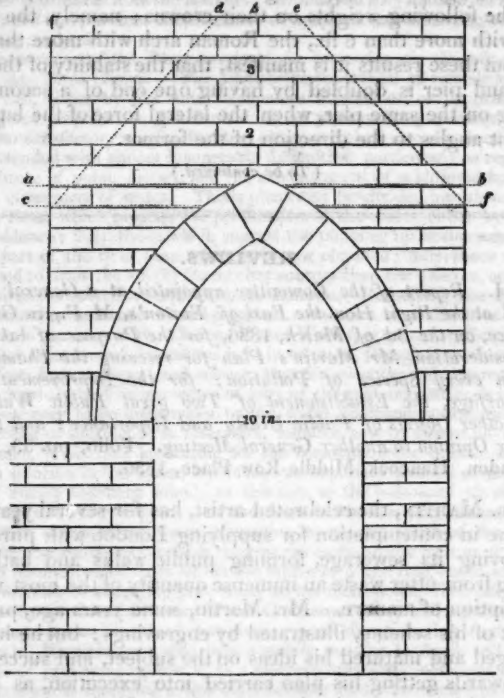

this arch of voussoirs only, and placed it upon piers of the same base and height as the arch *fig.* 139., it balanced under the weight of 3¼ lb. On raising the masonry, that is, the wooden bricks, up to *a b*, the arch and pier balanced with 6½ lb., or double of the weight which the arch and pier carried without the masonry. At the point 2, the structures stood firmly under a weight of 20 lb.; and, at 3, 28 lb. were not found too much for the structure to sustain. Upon raising the brickwork up three more courses, and removing the two angles *a d* and *e f*, the arch and pier just balanced under the weight of 28 lb. placed at the point 4.

These experiments with the Roman and Gothic arches show that the latter will support just double the weight of the former, under such circumstances as are described, and as are represented by the diagrams *figs.* 139, 140, and 141.

A Gothic and a Roman arch, of 10 in. span, composed only of voussoirs, having one end of each supported on the same pillar, or pier, of equal dimensions as that of *fig.* 139., and placed,

not abutting, but at right angles the one to the other, balanced with the following weights on their crowns; namely, the Gothic arch with more than 6 lb., the Roman arch with more than 3 lb.

From these results it is manifest, that the stability of the single arch and pier is doubled by having one end of a second arch resting on the same pier, when the lateral force of the latter acts at right angles to the direction of the former.

(*To be continued.*)

REVIEWS.

ART. I. *Report of the Committee appointed at a General Meeting held at the Right Hon. the Earl of Euston's, M. P., in Grosvenor Place, on the 3d of March, 1836, for the Purpose of taking into Consideration Mr. Martin's Plan for rescuing the Thames River from every Species of Pollution; for the Improvement of the Wharfage, the Establishment of Two great Public Walks, and for other Objects of Public Utility and Importance; and to report their Opinion to another General Meeting.* Folio, pp. 33, 1 plate. London, Hancock, Middle Row Place, 1836.

MR. MARTIN, the celebrated artist, has for several years had a scheme in contemplation for supplying London with pure water, improving its sewerage, forming public walks and baths, and saving from utter waste an immense quantity of the most valuable description of manure. Mr. Martin, some years ago, published a part of his scheme, illustrated by engravings; but he has since enlarged and matured his ideas on the subject, and succeeded so far towards getting his plan carried into execution, as to have procured its examination by a committee of influential and scientific men. This committee have published their report, the title of which is given above; and we shall quote largely from it, conceiving that, in doing so, we shall at once be forwarding the views of our esteemed friend Mr. Martin and the members of the committee, and laying before our readers information original, instructive, and highly entertaining.

"The committee having held several meetings, at which Lord Euston presided, with a full attendance of the members, including Major-General Sir Patrick Ross, deputy chairman, and having deliberately, and with great attention, considered the various statements, facts, calculations, and designs which were laid before them by competent persons, in explanation and illustration of Mr. Martin's plan, have agreed to the following report.

"The supply of water to the metropolis," the report states, "continues as polluted as ever; nay, more so than it was when the first complaints were raised against it, seventeen years ago, in consequence of the additional number of drains terminating in the river established since that time. No attempt has been made, even by the water companies, to deny the truth of this assertion; and the Thames, to this day, receives the excrementitious matter from nearly a million and a half of human beings; the washings of their foul linen;

the filth and refuse of many hundred manufactories; the offal and decomposing vegetable substances from the markets; the foul and gory liquid from slaughter-houses; and the purulent abominations of hospitals and dissecting-rooms, too disgusting to detail.

"*Enumeration of the Plans proposed for improving the Supply of Water, divided into Three Classes.* — The plans hitherto devised to remedy so great a public evil, either by the water companies themselves, or by private individuals, and proposed to government or to parliamentary committees, have led to no satisfactory result; for they either promised remedies ineffectual, or were attended with almost insuperable difficulties, particularly as regards the expenditure of public money, and the establishment of additional heavy rates on the consumers of water. Those plans may be divided into three classes: — 1st, those which propose the purification of the water, either by filtration or subsidence; 2dly, those which suggest the pumping up of the water from a higher part of the river than where it is now obtained; 3dly, those which recommend to draw the supply from other sources than the Thames, and convey it by means of extensive aqueducts to London. Respecting the *First Class* the committee entertain a well-founded conviction that filtration through sand (as in the case of the Chelsea Water-Works) is quite insufficient to free the water from animal impurities held in solution, though it produces a clear fluid, free from sediment and colour; that filtration through charcoal, which would deprive the Thames water of part of the said impurities, is by far too expensive ever to be undertaken by the water companies; and, finally, that the method of subsidence in reservoirs, adopted now by almost all the water companies, is not only ineffectual for the removal of the organic impurities held in solution in the water, but is also an imperfect method of depriving it of the muddy sediment found, to this day, at the bottom of all cisterns to which the water is conveyed. Of the *Second Class* it is only necessary to observe, that, unless all the water companies, north and south of the Thames, were simultaneously to establish their works as far to the west as at Teddington, no removal, to any part within the influence of the tide, could accomplish their intention of supplying pure water to the metropolis. The bill obtained last year by the Grand Junction Water Company, for establishing their engines and pumps below Brentford, has given general dissatisfaction to the householders of Westminster; who held a public meeting in April, 1835, for the purpose of protesting against it, as a measure manifestly inefficient in its provisions towards supplying a less objectionable fluid. In regard to the *Third and last Class* of projects submitted to parliament, the committee need only to state, in passing, that the one which seems to have been duly considered by a select committee of the House of Commons, so late as 1834, and which was presented by the late Mr. Telford, involves so much difficulty, and the outlay of so exorbitant a capital for the supply of six only out of the eight water companies, that there appears to be no likelihood of its ever being carried into effect. It is not probable, indeed, that any government will authorise the expenditure of 1,200,000*l.* for the erection of two aqueducts, the one *sixteen*, the other *six* miles in length, according to Mr. Telford's estimate, in order to bring water from the Verulam and the Wandle to assist six only of the water companies of the metropolis.

"*Origin, Nature, Objects, and Description of Mr. Martin's Plan.*—The inefficiency or impracticability of all these plans, and the universally admitted existence of a most serious grievance, which the best endeavours and unceasing vigilance of government have hitherto proved insufficient to remove, has, to this day, maintained the public mind, respecting this vital question, in that state of excitement which has now existed upwards of seventeen years. In this state of difficulty, it was given to the genius of Mr. J. Martin to devise the simplest, as well as the most completely effectual, plan for affording, at once, all that the public require, without injury to the rights and interests of the water companies, or interference with them; but, on the contrary, with manifest benefit to them, by saving any further outlay of capital, which they

might think themselves called upon to employ in fruitless endeavours to satisfy public opinion. This plan may be defined in a single sentence: it consists in diverting altogether from the river every possible source of pollution within the London district; so that the water supplied from it to the inhabitants by the existing water companies shall become as unobjectionable as a noble river in its natural state ever offered to man: for, according to Dr. Bostock's evidence, given before the royal commissioners in 1828, 'The water of the Thames, when free from extraneous substances, is in a state of considerable purity, containing only a moderate quantity of saline contents, and those of a kind which cannot be supposed to render it unfit for domestic purposes, or to be injurious to health.'

"*The Manner in which Mr. Martin proposes to accomplish this Object is by the Construction of a close Sewer, 20 ft. Wide, and of adequate Depth, along both Banks of the River,* commencing on the north near Milbank, and proceeding towards the Tower, round which it will pass, if required, to terminate near the Regent's Canal; while that on the south, beginning at Vauxhall, and proceeding in the direction of Rotherhithe, is intended to diverge thence, and terminate near the Surrey Canal. In order to dispose of the polluting drainage thus diverted from the river stream, and confined within these two sewers running parallel to the river, and with somewhat more than the declivity of its bed, Mr. Martin places two great receptacles at their respective terminations, so arranged and constructed, that the accumulation of all the drainage of the metropolis shall not be productive of the smallest annoyance or insalubrity to the nearest inhabitants. With this view, a system of ventilation will be established, both for the great sewers and the receptacles, which will prove equally simple and effectual, whether the committee adopt the one proposed by Mr. Martin himself, who has acquired much knowledge on this point, from having studied the ventilation of coal mines; or apply another, suggested by one of their members, equally competent for the task. In either case, however, the destruction of all noxious effluvia will be accomplished; a consummation which, coupled with the prevention (effected by the great parallel sewers) of the hitherto frequent inroads of the tide into the lower ends of the common sewers, and the consequent backing of the drainage in them, together with other measures for excluding all offensive smells through the street gullies, will render the London drainage more perfect, and the labours of the Commissioners of Sewers less difficult.

"*Erection of Two Lines of colonnaded Wharfs.*—Great and important as the first object unquestionably is, which Mr. Martin's plan is destined to accomplish, it is not the only benefit which the metropolis will derive from its being carried into effect. Although it seldom happens that, in adapting any very extensive remedy to a public grievance, or in undertaking a work of magnitude for the good of the people, local and individual interests are not in some degree injured or invaded, Mr. Martin's plan has the additional merit of being little exposed to such an objection. On the contrary, his plan, by the next object which it embraces, and which is, as it were, its natural consequence, is calculated to add to the value of most of the individual interests affected by the line of its operations. That object is the erection over the two sewers of a line of colonnaded wharfs, which will afford in front of the present wharfs additional room; increase the convenience of the merchant and the labourer; facilitate the operations of trade; give greater security to property landed from vessels and barges; improve the navigation of the river by the assistance of the subjacent sewers, which will constitute uniform embankments; and, lastly, add some portion of time to the number of hours during which the craft can deliver or take in their cargoes. The immense and recent advances which mechanical science has made in this country will enable the architect and engineer employed in the construction of these wharfs to take advantage of their uniform arrangement, and apply, through the engines required for the ventilation of the two great sewers and receptacles, either to the entire range of wharfs, or to any part of it where it may

be required, the power obtained from atmospheric pressure acting on a vacuum, which has been so successfully applied, of late years, to cranes and other machines, and which, in this case, it is presumed, would be gladly adopted by the proprietors of storehouses, manufactories and breweries situated on the banks of the river, whereby another great advantage to those proprietors would be obtained from Mr. Martin's plan. Respecting this useful application of mechanical science, the committee have the satisfaction of being able to refer to the opinion of one of their members, who is perfectly acquainted with the subject.

"*Formation of Two extensive Quays, or Public Walks.*—But even this great metropolitan advantage, secured by Mr. Martin's plan, must yield the palm to another of a more popular and attractive nature, arising out of the accomplishment of a third object contemplated, also, by Mr. Martin. The Committee, therefore, feel particular satisfaction in having further to report, that the same plan offers the most favourable opportunity of establishing, at a comparatively small expense, a magnificent promenade on each side of the river, unequalled in Europe, by the conversion of the roofs of the colonnaded wharfs, just described, into parapeted walks, to which the public will be admitted gratuitously on Sundays, and at the smallest rate of charge on every other day in the week. It is thus that the patriotic idea of Sir Frederick Trench will be realised, in respect to the erection of quays on the banks of the Thames, without the liability to the several objections which powerful individuals and public bodies made to the purely ornamental and architectural project of that gallant officer, who, with high-minded liberality, has declared Mr. Martin's plan to comprise more than his own, to be greatly superior in usefulness to the public, and to deserve his utmost support. It is thus, also, that the wishes, so often expressed, of late, by parliamentary committees, of affording to the mass of the population the luxury, salubriousness, and recreation of great public walks, in the very heart of London, will be accomplished at once, and on a more extensive scale than has ever before been contemplated.

"*Magnificent Architectural Promenade.*— It would be superfluous, on the part of the committee, to undertake to prove, that the establishment of a grand and magnificent public walk on each bank of the river, and behind a most crowded line of habitations running east and west of the metropolis, must be of infinite service to the neighbouring inhabitants, by affording them an opportunity of taking exercise in a reserved public walk (well calculated, too, for women and children), and of enjoying a free and open atmosphere during the days and hours not devoted to labour, besides the benefit of a more direct intercourse. To these advantages they are certainly strangers at present, owing to their remote position from the parks, and from every other general resort of pedestrians; and, although a select committee of the House of Commons did recommend, in 1833, an extension and improvement of the embankment along the river from Limehouse to Blackwall, at a considerable expense to the parishes within that district, so partial a measure could only be useful to those whose residence is contiguous to the walk, without being of service to the inhabitants of the more central parts of the metropolis along the north bank of the river, where it is most required. On this point the committee have obtained the opinion of one of their body, who is a medical man, and who, having practised for the space of twenty years as physician to three extensive public institutions in London, principally connected with the relief of the sick poor of the river districts, has had numerous opportunities of ascertaining the effect of the impure water of the river, of the confined air of the streets and alleys adjoining to it, and of the want of exercise, on the general mass of the inhabitants of those districts. The committee specially refer to that opinion, in addition to that of the witnesses examined before the parliamentary committee of 1833, principally because, in a question so entirely belonging to the consideration of public health, the long experience of a medical witness is more likely to carry weight with those who have the

protection of that health in their keeping. The want of means to take proper walking exercise, after a long day of laborious exertion, impairs the vigour of the body, produces among the working classes a morose and melancholy disposition, and engenders a spirit of dissatisfaction, which domestic privations are too apt to increase. Such feelings, in their turn, hurry their victims on to the resorts of the drunkard and the abandoned; where, if they imbibe not the spirit of discontent, they most assuredly sap the very foundation of their own health, and that of their future offspring. The committee, fully coinciding, also, in the sentiments expressed in the report of the select parliamentary committee, just alluded to, on public walks, refer with particular pleasure to the part of that report where the peculiar natural advantages which the metropolis might possess in respect to public walks on the banks of the Thames, are especially recommended to the consideration of the house of Commons.

"*Protection of Property.*— There is one more public benefit, which the establishment of a great walk on each bank of the Thames is calculated to secure, and which, hitherto, has not only remained unaccomplished, but has even escaped notice, namely, the protection of property on the river by night. It is a well-known fact, that, taking advantage of the many hundred craft which are left at night without a watch, and of the darkness, which conceals evil deeds, youthful thieves and others commit considerable depredations on the river. The brilliant illumination by gas of the great walks, and, if necessary, of the wharfs too, may be expected to put a salutary check to such guilty practices, and diminish the serious losses consequent thereupon; while the facility which the same walks will afford to the Thames patrol, of overlooking every movement on the river, will complete this not insignificant advantage to the public.

"*Formation of Public Baths.*— Connected, also, with the establishment of the great quays in Mr. Martin's plan, it will be found that an opportunity is afforded for the formation of large public baths, contiguous to the river, and so arranged that they shall not in the least interfere with the purity of the river stream. Respecting the necessity and utility of public baths, as far as regards the health and cleanliness of the working classes in London, it is scarcely necessary to cite any authority. Upon that important subject, however, as well as on the general effect which the extensive improvements and total changes effected, in the state of the river and its banks, by Mr. Martin's plan, will have in greatly promoting the salubrity of the populous districts near the Thames, the committee refer, with confidence, to the experience of the same individual whose opinion on public walks they have received, and who derives that experience from repeated observations made in London, and in all the principal capitals of Europe, constituting a valuable corroboration of the testimony of well-qualified witnesses given before the select committee on that subject.

"*Preservation and Application of Manure.*— The drainage received into the great receptacles, before mentioned, will be converted into manure, according to the method and practice very extensively adopted in China, on the continent of Europe, and of late years, also, in some parts of Scotland. This will be conveyed by well-devised arrangements, and under the influence of scientific measures, to different parts of the country, in covered barges, or properly constructed land-carriages. The value of this species of manure is almost incalculable. The best authorities place it far above every other, as containing in much greater abundance the very elements of which vegetable substances are composed, and on which their existence and growth depend. By saving, therefore, the vast quantity of it which has hitherto been wasted in the metropolis, a *Fourth*, and most important, benefit, that of fertilising, and rendering the land considerably more productive, will be conferred on the public, through the identical plan, which alone can secure to us the luxury of drinking wholesome and unpolluted water.

"*Financial Statement.*— On the financial part of a plan so simple, yet so

gigantic in its results, a plan, too, which seems encompassed by fewer difficulties requiring pecuniary sacrifices, than are generally met with in great public schemes, the committee do not think it necessary to dilate at length. They have, however," produced an estimate (signed, *R. Dixon, Fellow of the Institute of British Architects*), by which the expenses of construction are upwards of 1,000,000*l.* sterling; and another of income and expenditure, by which, after paying a dividend of 8 per cent., there appears a surplus balance of 206,000*l.*

The principal source of income is the manure, for which it is calculated to produce 200,000*l.*

The report is dated London, April 23. 1836.

App. I. *is a historical epitome of the water question from* 1810 *to* 1835.

App. II. *is a statement and calculation of the human impurities which enter the river Thames in the London district.*

App. III. *is a statement of Mr. James Mills* (*Engineer*), *Mr. Joseph Evans, and Dr. Bostock, as to the effect of the tide on the Thames water in the London District.*

App. IV. *is an enumeration of the several plans proposed for obviating the grievance of impure water complained of by the public.*

" App. V. *Remarks on the Inefficiency of Filtration and Subsidence, as Means of purifying the Thames Water of the London District, so as to render it fit for Domestic Purposes; founded on indisputable Chemical Facts.* (*Delivered to the Committee by* A. B. Granville, M.D., F.R.S., *one of the Members appointed to enquire into that Subject.*) — The permanent state of impurity of the water derived from the London district of the river Thames being admitted on all hands, and the plans for taking the supply, either from a much higher part of the river, or from other sources than the Thames, having never been carried into effect, it becomes evident that the only chance which the public has hitherto had, up to the present period, of seeing their daily beverage, and so important an article of diet as water, cleared of the filth by which it is polluted at the very source of its supply, depends on two methods, both of which the pressure of public opinion has compelled all the water companies to adopt, since the government and parliamentary enquiries into the supply of water to the metropolis: these methods are subsidence in reservoirs, and filtration.

" All the water companies in London have now reservoirs, in which the water is suffered to rest until the sediment has subsided, before it is delivered to the tenants. Assuming that this process is universally and *bonâ fide* adopted, there are two facts which prove, at once, its inutility for the purpose required. The first fact is, that the water received into the tanks, or cisterns, both with the ordinary and high service deposits, even now, at the end of some days, a considerable portion of muddy sediment, and just as foul as had been observed before the great enquiry had led to the adoption of reservoirs for the subsidence of the impurities of the water.

" Dr. Bostock, in his evidence before the select committee of the House of Commons in 1834, stated, that, even at the present time, the water supplied by the New River Company to his cisterns, not only deposited much of its mechanical impurities after rest, but remained still brown and muddy, and was far from being pure at last. The same remark has been made by several other witnesses, and by myself more than once, with regard to the supply I derive from the Grand Junction Water Company Within the last few weeks, I had occasion to clean the upper cistern at the top of the house, on account of some fracture in the bottom lead, when I found two inches of thick, filthy, and foul-smelling deposit in it, although the operation of cleaning the same cistern had been performed only twelve months before. Indeed, the water in the said cistern, placed at an altitude of ninety feet from the street, does never look otherwise than like dirty pea-soup, owing to the frequent stirring up of it, by the coming in of the fresh supply three times a week. The second fact is, that, supposing even the water to be served without any sediment whatever, still the highly soluble parts of that peculiar extractive animal matter, which,

by the experiments of Berzelius, is proved to constitute the distinguishing character of human stercoraceous substances, would be present, and is actually present, in the clear liquid, to the extent I have already mentioned. This soluble matter amounts, according to the celebrated Swedish chemist, to sixteen parts in every hundred, of which sixteen parts one and a quarter only are salts, and the rest the peculiar animal matter in question, which, certainly, is not fit to be reintroduced into the living body! But this is not all; for, according to another eminent chemist (Le Sage) the proportion of soluble matter in the human ordures, when it has passed into a state of putrefaction (as most of those must be which are supplied by the sewers to the Thames) is nearly doubled!

"The process of subsidence might, indeed, be made to free the water altogether of its animal impurities; but, in that case, the state of rest of the water to be so purified ought to continue for a much longer period of time than the companies have allowed, or can afford to allow; and even then, instead of the soluble animal impurities, removed by the lengthened process, there would be substituted the presence of soluble salts, increased to four-fold their quantity, originally contained in the water. This curious fact was ascertained by Dr. Bostock, who communicated the result of his interesting enquiry to the Royal Society in 1829; from which it appears that, if the Thames water be suffered to remain at rest, completely undisturbed, for a period of many weeks, fermentation will take place, in consequence of the presence of the softer portions of human ordures; the liquid will become clear, with the exception of a small proportion of insoluble sediment; it will lose all unpleasant smell, taste, and colour; and present, instead of animal impurities in solution, an increase of its ordinary saline contents. This increase is to the extent of between two and three times, with regard to chalk, or carbonate of lime; of between five and six times, with regard to gypsum, or sulphate of lime; and of twelve times the usual quantity, with regard to common salt, or muriate of soda. By this change in the relative proportions of its saline contents, the water ceases to be soft, and becomes hard, inasmuch as each pint of it is found to contain four grains and $\frac{44}{100}$ of saline matter. Supposing, therefore, that the companies were to establish reservoirs of such magnitude as to allow the water to be lodged undisturbed therein, during a period of time sufficiently long for the depurative process by spontaneous fermentation to take place, which is to destroy all animal impurities in it, they would still supply the public with what, although clear and inodorous, would contain enough of chalk and plaster of paris to multiply, and render more severe, the various and innumerable degrees of derangements of the stomach and bowels, which so generally prevail in, and are almost peculiar to, this metropolis.

"The celebrated Dr. Trotter, physician to the fleet, and author of a valuable work on the preservation of the health of seamen, had already observed this curious fact on board of the King's ships during long voyages, which explains the common notion entertained, that Thames water is the best that can be used on ship-board; a notion which has been actually made use of as an argument to prove the purity of that water. Dr. Trotter states that this water, contained in casks, becomes putrid soon after one or two months of its embarkation; that a quantity of inflammable air is disengaged from it; that it gets very dark and offensive, throwing down a black deposit, and at last becomes clear and palatable. It was left to an equally eminent physician, and a much superior chemist, in our days (Dr. Bostock), to discover the rationale of such a spontaneous process of depuration in the Thames water of the London district.

"Filtering through sand and *charcoal*, as executed to some extent with the water of the Seine, in Paris, would certainly remove the entire of the coarser sediment, and the greater part of the animal impurities, from the Thames water; but even this process is incomplete with regard to the latter benefit; since, according to recent experiments, a cubic foot of the water, so filtered, is still eighty-five grains heavier than the same quantity of distilled water.

Moreover, the enormous quantity of charcoal that would be required, even by this imperfect, though the best of the processes yet proposed for the purification of the Thames water, would naturally entail an expense which must preclude the water companies from adopting it. As to any other mode of filtering Thames water, it is useless to waste a single word about it; since it has been established by the experiments of Parmentier and Cuchet, that filtration very imperfectly deprives water of its impurities, in which animal and vegetable matter have been long in solution; and even Mr. Simpson, the engineer, who advocated the system of filtration adopted by the Chelsea Water Company, and superintends it, admits in his evidence before the select committee of the House of Commons in 1828 (See Report, p. 15.), that 'the process of filtering will not purify water which should contain many ingredients chemically dissolved.' After all, what serves subsidence or filtering in the case of such water as that of the London district, supplied to the metropolis has been proved to be! Would any one, knowingly, and with cheerfulness, drink a tumbler of water from a river spring, which should have previously run through a succession of cess-pools, and afterwards been filtered through sand and gravel, because it may then appear clear and transparent? Yet such is the case with us, collectively, who drink, in some way or other, the Thames water of the London district!

"What, then, are the conclusions to be derived from the various parts of the present statement in reference to the supply of water in London? They are as follows:—

"*First*, That the water of the Thames, in front of London, is *always* in a most intense state of pollution.

"*Secondly*, That the process hitherto adopted for purifying it (subsidence) has proved insufficient, and leaves the most objectionable impurities still behind in the water.

"*Thirdly*, That even a more effectual process (fermentation, supposing it to be adopted, notwithstanding the great waste of time and money which it would entail) would only substitute one evil for another, as far as the health of the consumers is concerned.

"*Fourthly*, That the most perfect, even, of all the processes of purification (filtration), were it practicable, would not free such polluted water as that which we derive from the river (where it passes through London) from all its disgusting and injurious properties.

"And that, therefore, the only real remedy is to adopt the plan which turns away from the river the numerous streams of impurities that flow into it at present. And that the evil to be thus remedied is one fully, experimentally, and mathematically demonstrated; one which is of most serious injury to the health of a million and a half of the King's subjects; one, in fine, to which the public authorities cannot much longer refuse their most earnest attention.

"App. VI. *Mr. Telford's Plan for amply supplying the Metropolis with pure Water by six of the present Companies.* (*Submitted to the Committee of the House of Commons in* 1834.)—It consists of two divisions. One refers to the supply by the three western water companies on the north side of the river; the water to be taken from the Verulam, and conveyed to a reservoir on Primrose Hill, by an aqueduct sixteen miles in extent. The total expenditure of this plan, in round numbers, is stated at 800,000*l*. The second division of the plan is to supply with pure water the district on the south side of the Thames by the three southern water companies, the water to be derived from the Wandle at Beddington Park, to a reservoir at Clapham Common, by an aqueduct six miles in length; and at a cost, in round numbers, of 400,000*l*. Total expenditure for the supply of the six companies, 1,200,000*l*. If to these we add Mr. Mills's plan for supplying the two remaining companies, namely, the New River, and the East London Water Company, with pure and soft water for the use of their tenants, taken at Ware from the river Lea, and conveyed to Newington by a conduit of twenty-eight miles, we shall find a total expen-

diture required for settling the "much-vexed" question of the water supply to the metropolis, to amount to 2,060,000*l.*, and the length of aqueduct necessary for the purpose equal to forty miles.

"App. A. No. I. *Mr. Martin's Statement of the intended Construction of the Two great Sewers parallel with the Banks of the River Thames.* (*Communicated by him to the Committee.*) I propose that on the north bank, and for the western extremity of London, a receptacle should be formed above Vauxhall Bridge, for the purpose of receiving the King's Scholars' Pond sewage, and all the other minor drainage of that quarter. For the body of the city a grand sewer must be formed, to commence about the bottom of College Street, Westminster, near Millbank, running parallel with the bank of the river, and receiving all the drainage from the North part of the metropolis, which now enters the Thames. This grand sewer should be constructed of either granite or iron, the top forming a quay, or line of wharfs, which should be above the highest possible tide, so as to secure the houses upon it from inundation, where the banks are now so low as to subject them to it. The sewer should, also, increase in depth as it continues its course towards the Tower, where it should turn off, using the moat, if permitted. In the event of that not being allowed, it would pass round the moat, behind the London Dock, along Ratcliffe Highway, Brook Street, and the intermediate street, to the first convenient space near the Regent's Canal, where the grand receptacle should be established for the whole drainage.

"For the south side of the river the same plan should be adopted, commencing near Vauxhall Bridge, passing along the bank of the river to Pickleherring Stairs; then branching off through Rotherhithe to any convenient spot adjoining the Grand Surrey Canal, where the grand receptacle for the south side will be constructed, on the same plan, and for the same purpose, as the receptacle near the Regent's Canal on the north.

"Provisions will be made for preventing the choking or bursting of the great sewers, particularly that on the north bank, during extraordinary landfloods, and also for clearing their interior from any obstruction that may occur. The first object is to be accomplished by having, in the side of the great sewer next to the river, and at the upper part, opposite the end of each great street drain, a flood-gate, nearly six feet in length; so that if the sewage should ever rise so high, it would at once escape into the river. To afford facility for cleansing each great covered sewer, there should be large flood-gates to the depth of the sewer, to be opened when necessary.

"The second object will be effected by the erection of a light iron gallery, about three feet wide, and six feet and a half from the top of the drain, to be supported on one side by the wall towards the river, and on the other by suspending light iron rods from the roof. A man would pass along this gallery, carrying a safety lamp, to see and remove any obstructions that might accidentally have occurred in the sewer. The entrance to this gallery should be through the smaller flood-gates, before mentioned, in the side next to the river, and they should be left open while the man is in the sewer, to admit some portion of light and air.

"The depth of the great covered sewer would be twelve feet from the highest high water mark known to the base of the sewer. The declination should be twelve inches in the mile generally, and eighteen inches where, by its course, it takes one or two turns. By this arrangement the bottom of the great sewer will be sixteen feet above low water.

"App. B. No. I. *Manner in which Atmospheric Power is intended to be generated and applied, in that Part of Mr. Martin's Plan which relates to the Structure of the Wharfs; with the Employment of that Power for moving every Sort of Machinery.* (*Communicated to the Committee by Nathaniel Ogle, Esq., One of its Members.*) — In another document which I have laid before the committee (Appendix D. I. Ventilation, 2.) I mentioned that, over the great receptacles fires will be placed for the purpose of destroying the effluvia arising from the fermenting mass, and for ventilating the general system of the Lon-

don drains, as well as the two great parallel sewers. The heat from those fires will not be wasted, but used to generate steam, which, besides working, by engines, the pumps destined to remove the manure from the receptacles, in the manner described by Mr. Martin, may be applied to another great and important object; namely, the creation of a source of power, transferable with certainty to every spot along the whole line of wharfage, and to every manufactory requiring power for every conceivable purpose. The simple and undoubted method by which this object is to be attained I shall now proceed to describe.

"The engines already mentioned, by being connected with exhausting pumps, would draw out the air from the hollow architrave over the wharfs, as well as from each hollow pillar by means of pipes, and thus create a vacuum in tens of thousands of cubic feet, of hollow pillars and their connexions. That vacuum enables the atmospheric pressure to be made available as a power along the entire range of wharfage, and in all its ramifications; so that every wharf could be supplied with a machine of any required power, for raising merchandise, or other operations; while to every adjacent manufactory such a power could be distributed with the utmost certainty and facility. Even the removal of the manure from the great receptacles might be effected by means of this power, instead of consuming the power of the steam-engine for that purpose. If, near the upper part of the works, where the great parallel sewers begin, flood-gates were constructed, so that, if required (particularly in summer), the whole main sewer could be washed perfectly clean, the water might, in that case, be used, before it flowed into that main, as power to increase the vacuum. Its agitation by a wheel would impregnate it with more atmospheric air, and thus render it capable of performing a double duty; that of cleaning the great sewers, and of supplying to the fires an additional quantity of the supporter of combustion. Nor is this a superfluous provision of means; for, in proportion as vacuum power will become more generally appreciated, through its establishment in this great architectural structure, and consequently more in demand, a greater supply of fuel will be required, as well as a greater supply of air for its combustion.

"I may here remark, that this atmospheric, or vacuum, power, in itself so simple, yet so efficacious, and so perfectly transferable to any distance, as well as through every ramification of Mr. Martin's structure, that it may be used either as a mighty engine, or, by subdividing it, as a power to facilitate the most delicate fabrications, is not new. The Mint works at Utrecht are carried on by it; so are those of the Mint at Rio Janeiro. Mr. Forster, of Stourbridge, has had one at work for some years. Several sugar-houses in the city raise to the summit of the loftiest warehouses casks of sugar by it. Messrs. Brown, near Manchester, have a sixty-horse power of this sort at work. At Hornebush, in Cornwall, there is one placed at four hundred fathoms from the primary power; and, sooner or later, England will witness, after the completion of Mr. Martin's plan, the general extension of this power of the atmosphere, which has long been known. Dr. Alderson of Hull used it for many years; and a very imperfect application of it has also been made to some of the works in our own Mint. The present improved system of it is due to that ingenious and experienced engineer, John Hague, who some years since drained the district of Littleport and Downham, which had been pronounced irreclaimable. When this power can be hired, people will gladly take it in preference to steam power; and thus, by creating it, and letting it out in different parts of Mr. Martin's works, on the banks of the Thames, we shall lessen the volumes of smoke which now cross the river from the south bank and pass over London, while we increase the revenue which may be expected to flow from the execution of Mr. Martin's plan.

"App. C. No. I. *Architectural Outline of the intended Range of Wharfs and Public Walks.* (*Presented to the Committee by* J. Martin, Esq.)—The style of architecture best adapted to my plan is either Tuscan or Doric; but the buildings on and near the public walks should be suited to the locality: for

instance, the Corinthian order should be adopted to carry on and compose with Somerset House. The western side of Waterloo should be Tuscan, since that noble structure is of that order; and near the houses of Parliament Gothic should be used, so as to harmonise with them and Westminster Abbey. Thus there would be grandeur, simplicity, varied interest, and complete harmony, without monotony. There should, likewise, be handsome landing-places, with terraces, and beautiful gardens, with fountains, where there are spaces fit for the purpose, and there would be many such on the large portion of recovered ground. Upon the recovered ground, between Westminster Bridge and Hungerford Market, the houses of parliament (if the sites for them be not already determined upon), or any other great public buildings, might be raised. I should, however, give the preference to the formation of gardens, as they would form so splendid an addition to the houses at Whitehall, Privy Gardens, Northumberland House, &c. The unsightly coal wharfs and sheds, which at present interrupt the prospect and circulation of the air on the banks, should be compensated for, and removed either farther down, or higher up the river. Near to the Grosvenor Canal would be an admirable spot, affording every facility for transporting the coals from the river, without impeding other traffic, as is the case at present, owing to the great coal waggons going from Scotland Yards, and other parts, into the leading streets. A flight of steps should lead from each end of the bridges to the public walks, which would pass under the arches. The proposed plan for a new bridge opposite Hungerford Market will not only interfere with that fine structure, Waterloo Bridge, but injure the grand space between that and Westminster Bridge, which is already sufficiently near to the former. By my public walks, the communication between the two bridges, and, consequently, between the two sides of the river, would be made more direct; and thus a greater facility, and pleasant means of proceeding from one point to another, would be afforded; whilst from the same public walks our numerous bridges would appear to additional advantage. These improvements would greatly increase the number of water parties and regattas on the river; and, by thus giving increased interest and life to the scene, add much to the pleasure of those who viewed them from the shore, and likewise benefit the various branches of trade in the vicinity.

"App. C. No. II. *Extract from the Report and Evidence laid before the House of Commons, by a Select Committee appointed February*, 1833, *on the Necessity of Public Walks, and the Propriety of establishing Public Baths.* — It cannot be necessary to point out how requisite some public walks, or open spaces, in the neighbourhood of large towns must be, to those who consider the occupations of the working classes who dwell in them.

"*Questions to Mr. Stock, a Magistrate for the County of Middlesex.* — 'The committee have been told, that, from the Hampstead Road, taking all round the north and east of the metropolis, until you come to the Thames, there is no spot reserved as a public walk, or open space, in which the middle and decent classes resort to walk with their wives and families, except a public thoroughfare? That is a perfectly correct statement.—Is it not your opinion that, with the increasing population, and numerous buildings and enclosures, it would be highly desirable for the health and comfort of the middle and humbler classes that such public walks should be provided? I think it is imperatively called for with a view to their morals and comfort.—If some provision could be made to provide public walks, and places of exercise for the humbler classes, to which they might be admitted under proper regulations, *on the payment of a trifling sum;* do you think it would be of great advantage to them? It would be the best thing that could be done for the health, morals, and satisfaction of the working classes. — Would such places wean them from public-houses and drinking shops, into which they are now driven by having no source of amusement afforded to them? I have no doubt.—Do you believe they would be willing to pay a *trifling admission* for the purpose of having a place provided, to which they might resort when they had a little spare time? There is no doubt of it.' (Page 17, 18, 19.)

" Several other witnesses, magistrates and coroners, having been examined respecting these several points, confirmed the statement and evidence of Mr. Stock, in as far as regarded their respective districts, north and south of the river, in which they had resided for many years.

" Most of the suggestions thrown out by these witnesses, in the course of their evidence, refer to the establishment of public or reserved walks along the margin of the river. Mr. James Bailey states, that the walk which would be most appreciated by the inhabitants on the south side of the Thames, would be one placed along the margin of the river, because there is always something passing up and down.

" But by far the most important evidence is that given by Thomas Saunders, Esq., one of the wardens of St. Saviour's; who not only lays great stress on the necessity of public walks, but also on the superiority of those established near the river, respecting which his observation is worthy of being quoted, as bearing on a part of Mr. Martin's plan.

" 'If the space from Back-end towards Blackfriars' bridge were improved, would it be eligible for a public walk? It would be of immense benefit to the public.—This space, by some improvement, and by carrying out the embankment might be made a place fit for a good public walk on Sunday evening? I think it might.—Have you formed any opinion as to the expense of this improvement? I have not formed any idea of the expense, neither am I capable of doing so; but, if the proposed measure should not be found to impede the navigation of the Thames (which, speaking as an unscientific person, I should say it would rather benefit than otherwise), *the proprietors of wharfs, if they had additional ground laid into their property*, might not raise any objection.' (Page 31.)

" Mr. Saunders seems well versed in the history of the banks of the Thames, and exposes the several and gradual encroachments made on the rights of way once possessed by the public on both banks, particularly on 'an actual space forty-two feet wide, from the Temple to the Tower, on the north side of the Thames, which was granted by parliament, and placed at the disposal of Sir Christopher Wren, for the erection of a public walk.' This space, however, either from the laxity of the city authorities, or of the public, or of parliament, has, from gradual encroachments, first by cranes, then by sheds and counting-houses, at last got up into brick buildings, and the citizens of London have been deprived of all that splendid intention. (Page 31.)

" A question was put to Mr. Robert Sibley, an architect and surveyor, whether he thought that 'an embankment might be made in the vicinity of London, on the north side of the Thames, which would form a very fine walk for the inhabitants?' 'I think nearly the whole line of the Thames might be embanked, so as to form a quay.'—'Would the expenses be very great to make a walk of sufficient length in the situation you speak of?' 'It would be considerable, but I should think a portion of it might be defrayed by letting off for wharfs.'—'Would not a walk be healthy from the freshness of the air coming in with the coming tide?' 'Yes, I should think, the best air you could possibly get.'—'Does your remark about the practicability of making a public walk on the banks of the Thames apply itself equally to the other side of the river?' 'Equally so.' (Report, page 17.)

" The same committee directed their attention to the subject of public baths, as will be seen from the following interlocutions with Mr. Stock:—

" 'Are there any bathing-places reservedu pon the river Lea, or on the banks of the Thames, to which the humbler classes might resort to bathe?' 'None whatever, and they are prohibited by orders from the police from bathing. The place most frequented for bathing now in our neighbourhood is the Canal from Limehouse to Bromley. They are prohibited, and boards are fixed prohibiting them from bathing there; but they do it at their peril, being sometimes taken into custody for it.'—'This prohibition arises from a desire to promote public decency?' 'The establishment of separate baths would certainly do all that, and it would be very conducive to health.'—'Might not

such a thing be established at no very great expense, and be at the same time a great benefit?' 'It might.'

"App. C. No. III. *Observations on the Importance of Walking Exercise for the Preservation of the Health of the Working Classes; on the many Advantages that would result, in a Medico-political point of View, from the Improvements produced by Mr. Martin's Plan in the State of the River, and of its Banks; and lastly, on the Necessity of encouraging the Practice of Bathing among the humbler Classes of the Metropolis. (Presented to the Committee by* A. B. Granville, M.D., F.R.S., *one of the Members.)*—Nothing is more useful to the preservation of health than bodily exercise, and the open air. In large and populous cities, where the working classes are deprived of the means of enjoying either of these blessings, after their heavy day's labour, we find the hospitals and infirmaries crowded with invalids. London stands preeminent in this respect; and, although the annual mortality, in every hundred sick persons, be inferior to that observed in most of the continental capitals, owing to superior medical treatment, it is nevertheless true, that there is always a much larger proportion of people suffering from acute, as well as chronic, disorders in London (and, consequently, more pauperism and inefficient population), than any where else. There are not fewer than sixteen hospitals, and twenty-six acknowledged dispensaries, in the metropolis, besides the numerous parochial infirmaries, which are generally large; and they are all fully engaged in alleviating human bodily sufferings. It is principally the sedentary life, which the working classes lead, that occasions this state of things. Want of the means of taking exercise produces, moreover, in the same classes of people a melancholy and morose disposition, and a spirit of dissatisfaction, increased by the want of domestic attraction, and impaired health. These, in their turn, hurry their victims on to the resorts of the drunkard and the discontented; where, by indulging in the temptations which the place offers, they sap the very foundation of their own health, and that of their future offspring. An inspection of the children of these classes, in the rising generation, proves too well the truth of this assertion.

"Were it not for the high winds, which so frequently sweep up and down the river, we should, most assuredly, have on the shores of the Thames those serious epidemic disorders which infect the banks of the Tiber, and, occasionally, those of the Danube at Vienna; and which are to be met with, even on the banks of the Thames in very sultry seasons, and during any considerable prevalence of calm weather. But even the benefit which an ascending and descending current of air is known to generate, by fanning the infected atmosphere of the banks of the Thames, will be a hundred-fold greater, and, indeed, most complete, whenever that current shall be made to sweep up and down the river, between two lofty embankments, free from polluted mud and its emanations. In the case of the inhabitants of the Tower, much as they feel the depressing effects produced by their situation, owing to the present state of the river (effects which I have had professional opportunities of ascertaining), the mischief to which they give rise would be much more considerable, did not the dwellers of those buildings stand on an elevated platform, as it were, with a sort of promenade in front of the river. Hence, it is evident that a plan like the one which the committee is engaged in developing and supporting will reckon, among its many and manifest advantages, that of giving to the neighbourhood of the river a higher standard of salubrity.

"If, on the score of public health, the effect of embankment, north and south of the Thames, throughout the London district, is thus rendered manifest; on the score of public comfort and public interest, that effect will not be less conspicuous. On these points I quote with particular satisfaction the clear and convincing proofs adduced to the committee by one of its members, to whom we are indebted for the application of vacuum power in the structure of Mr. Martin's wharfage. His words are as follows:—

"'The navigation of the Thames would be materially improved, because:—

" ' 1st. An uniform surface, on both sides of the river, would remove the reflecting and baffling currents, which are now caused by the inequality of the wharfs, and the jutting out of encroached quays; projections which those reflected and baffling currents render, at times, dangerous of access.

" ' 2nd. The stream, being so little diminished by the intended structure, the mean elevation of the water would not be perceptibly affected; and, consequently, the improved state of the drainage of the lower lands (which has ensued from the lower level of the ebb, since old London Bridge has been removed) would not be injured.

" ' 3rd. The currents, being no longer reflected, shoals would not be produced, as at present, and the general scouring effect of the water would act more uniformly, and tend to keep the main channel of more even depth.

" ' 4th. The purified condition of the water would be followed by the return of the fish to the river stream, the present absence of which, and its cause, are fully made out in Mr. Goldham's evidence.

" ' That individual says, " I was yeoman of the market (Billingsgate) twenty-five years ago; and at that time there were four hundred fisherman, each having a boat and a boy, fishing above and below London Bridge; and now there are not two hundred men engaged in this fishing, and many of them are selling off their nets and boats." '

" Any injury committed against a portion of the maritime population of the country is ever to be deprecated, and becomes a subject of the most serious consideration of government. To render scarce, by careless and imprudent measures, the supply of any article of food to the public, is another subject of not inferior importance. A revival, therefore, of the fishing in the river would form no paltry addition to the benefit to be expected from the adoption of this great work.

" It has likewise been remarked by Mr. Britton, in committee, and also in his public lectures, that ' the perpetual accumulation of solid matter in the Thames must ultimately fill its channel, derange its course and purposes, and, like the classical Tiber, become rather a curse than a blessing to the city which adorns its banks.'

" We have, lastly, another advantage connected with public health and comfort, which will be derived from Mr. Martin's plan; and that is, the facility afforded by it for establishing public baths contiguous to the river.

" Two extensive reservoirs, surrounded by light and appropriate buildings, might be established, the one in some convenient spot, to the east of the metropolis, not far from the river; the other, situated under similar circumstances, to the west; each of which, by catching the stream of one of the clear rivulets (that now flow into the Thames) before it reaches Mr. Martin's great sewer, would form a large public bath, where people might, for a very trifling charge to them, indulge in the luxury of procuring bodily cleanliness, and the enjoyment of swimming exercise, without exposure of their persons, and in water which shall not disgust them, as the river stream does at present. The water would necessarily be kept in a state of purity by the uninterrupted flow of a fresh stream into the reservoir, and the possibility of partially emptying it into the great parallel sewers. Such establishments should, as far as possible, be within the reach of the most crowded districts near the Thames, where the blessing of being able to bathe in clean water, at a cheap rate, is most needed in the metropolis. It is a lamentable fact, that in point of bodily cleanliness, the working and inferior classes of the population of London, particularly the females and children, are lamentably deficient. Although the English, compared to other countries in Europe, are by no means a bathing nation, there is some excuse for them, in the difficulties thrown in the way of their more frequently adopting so wholesome a practice. Of a million and a half of inhabitants in London, not so many as fifty thousand, perhaps, repair, during the summer, to the banks of the Thames, or to those of the Serpentine river, to the canals, or to some of the reservoirs near London, for the purpose of bathing. There, even, they are met by restrictions

and regulations calculated to check their inclination; whereas a wise government ought to avail itself of every legitimate means, and seize every proper opportunity, of encouraging it, and thus render the practice of bathing a national habit. On this subject the evidence, which accompanies the report of the parliamentary committee on the public walks, is full of information confirmatory of the opinion I have just expressed; and is calculated to impress government with the conviction, that the time is arrived when they must attend to it.

"App. D. No. I. *Receptacles. Description of the great Receptacles for the Drainage conveyed by the Two great Sewers, with a Waste Receptacle to be used in Cases of strong Land Floods, and High Tides, and Manner of removing their Contents. (Presented to the Committee by* J. Martin, Esq.) — The grand receptacle, at the end of each of the great covered sewers, should be fifty feet deep, one hundred yards long, and thirty yards wide. A division down the centre, in a line with the mouth of the sewer, separates it into two equal compartments. A flood-gate placed at the mouth of the great sewer will open, by means of a lever (like the long lever of a lock-gate in a canal), into either the left or right compartment, at its inner angle; namely, that nearest to the mouth of the sewer; in such a manner, that, while the action of the lever opens the one gate, the other will be closed. Through one of these gates at a time, the sewage will be running into the right or left division of the receptacle; in which the heavier and grosser parts will sink to the bottom, and gradually fill the compartment as high as the level of the lower part, or base, of the great sewer. This gate will then be closed, and the one leading into the other division of the receptacle opened, for the same operation; and so on alternately.

"The grand receptacles should be emptied by means of engines, which should pump the material into a large cylinder, running parallel with the top. When the pump is working, a large wheel should be kept constantly revolving, in order to give motion to the manure, so as to prevent the choking of the works. From the cylinder, a sufficient number of hose, with cocks, should convey the material, at once, to as many covered barges as might be required for transporting it by canals into the country, or some convenient depôts along the banks: boxes, or close carts, like watering carts, could be used, when requisite, for land conveyance.

"To provide for the waste waters, in time of floods, or exceedingly high tides, I would add to each grand receptacle above described a third one, by the side of it, about one hundred yards square, and of the depth of low water, into which the thin and watery parts should flow, when the tide rises so high as to close the valve-sluices of the receptacles. The sewage, being thus backed, would rise about two feet, and would then flow through the side valve-sluices into the waste receptacle, which would relieve itself, by means of other sluices, into the river at the ebb of the tide at a place below the London district. If the waste receptacle should fill faster than desirable, the engine used for filling the barges could be employed in relieving it, until the turn of the tide, when it could be applied to its original purpose.

"As an essential part of this system, it will be necessary to protect all the principal metropolitan drains, which are to pour their contents into the grand sewer, from the admission of anything, besides fluids, from the streets, and likewise to prevent the smell from rising out of them. For these purposes a grating and trap, on the following construction, should be placed at the head of each drain, whatever may be its size, which will obviate the possibility of its being choked with dead dogs, cats, rags, straw, and grit from the streets; at present forming an evil of such extent, that it is found necessary to employ men purposely to walk the drains in order to remove those obstructions. This trap is simply a square cast-iron box, open at the top, on which the grating, as it exists at present, should be placed. There should also be an opening, two thirds down on one side, against which a slate flap should be suspended from the edge of the square grating at the top; and the bottom of this flap should rest on the outer edge of the opening below. By these means

the smell from below would be shut out; the water from above would run freely into the drain; and the heavy substances, grit, &c., would fall into the bottom of the box, so as to be removed at intervals by the street cleansers. It will at once be perceived that a trap on this construction would act both in wet and dry weather; whereas the one that is now occasionally used acts only during the prevalence of wet; and, when the weather is dry, the effluvia from the drains are horrible.

" *Ventilation. Mode of ventilating the Sewers.* (*Proposed by* J. Martin, Esq.) —For the ventilation of the great sewers, a fire should be placed at the higher end, supplied with no air but that which would proceed from the great drains; thus, not only would the bad air be drawn from them, but, by passing through the fire, it would become so purified as not to injure the external atmosphere. If a necessity arise for any repair, &c., in any of the lesser drains, a fire should be placed at the higher end, and the trap beyond the place where the repair is going on should be opened; thus placing the men in the current of fresh air going from the trap to the fire, and preventing the escape of the foul air into the street.

" *Mode of ventilating the Receptacles and Sewers generally, and of destroying all noxious Effluvia from them.* (*Proposed by* N. Ogle, Esq.) — Anxiety will naturally be felt respecting the method by which the exhalations from so large a collection of animal and other impurities, amounting, at a moderate computation, to several millions of pounds, are to be rendered imperceptible to the senses, and innoxious to health. With a view of removing all such feelings, I submit the following explanation of this very essential part of Mr. Martin's plan: —

" Over the great receptacles fires will be placed, so arranged that no air shall reach them but that which has been drawn through all the ramifications of the sewers which intersect the ground beneath the streets. Thus a constant in-draft of atmospheric air will be drawn down into the great sewers, which will prevent the effluvia, now too commonly perceptible during particular states of the weather, from rising into the houses or roads. As the heat from these fires will be used to generate steam to work, by engines, the pumps which are to be employed for the double purpose of removing the manure from the receptacles, and of producing a vacuum in the hollow columns and architraves, by which atmospheric pressure may be used as a constant power at every warehouse, wharf, and manufactory; the establishment of such fires will afford three direct advantages. But, besides these, another important result will be obtained from them; for, by blowing the waste steam, which has passed the engines, into the lofty chimney placed over the receptacles, another vacuum will be created, which will draw up through the fires, with vast rapidity, the air commingled with the sulphuretted, the carburetted hydrogen, the carbonic acid gases, and whatever else may be evolved from the fermenting mass. In order to keep those gases always in motion, the atmospheric air extracted from the hollow columns and architraves, as before stated, will be ejected with force into the great receptacles, thence to be drawn through the fires by the action of the above chimney. By this process all effluvia will be destroyed.

" App. D. No. II. *Short Memoranda on the Nature, Value, and Application of Human Manure, deduced from Facts, and Agricultural Experiments.* (*Drawn up, at the Desire of the Committee, by* A. B. Granville, M.D., F.R.S., *One of the Members.*)

" App. D. No. III. *Presumptive Proofs of Income.*

" App. D. No. IV. *The Institute of British Architects' Letter to John Martin, Esq., dated* 43. *King Street, Covent Garden,* 3d *March,* 1836.—' My dear Sir,—As you were yourself present at the last ordinary meeting of the Institute, held on Monday, the 29th of February, you are fully aware of the intense interest with which the members received the description of your admirable project for improving the discharge of the sewage of this metropolis, and relieving the Thames from those impurities which now so materially injure its

waters, and affect the health of the inhabitants. I am, however, directed by a special resolution, passed on that occasion, to present to you the thanks of the Institute for having submitted this important subject to their notice. Perhaps this acknowledgment may not be considered by you the less valuable, as proceeding from a body of professional men, whose practical experience enables them, even from so brief a view of the subject, to appreciate, in a general way, the important results which might arise from the adoption of a plan of such a nature. I am, my dear Sir, with every expression of sincere regard, yours very faithfully and truly, — *Thomas L. Donaldson, Honorary Secretary and Corresponding Member of the Institute of France.*"

That we have thought on the different subjects treated of in this *Report*, will appear evident from two articles; the one, *A Plan for saving the Manure lost in the common Sewers of London, and rendering the Thames Water fit for domestic Purposes;* and the other, *On Breathing Places for the Metropolis, and other Towns*, which appeared in the *Gard. Mag.*, vol. v., for 1829. It will be seen, even from the titles of these articles, that we approve of the general principle of preventing the London sewers from emptying themselves into the Thames; and of saving every particle of the manure which they contain. We differ, however, from Mr. Martin, in preferring several intercepting sewers to one, which one, from its unavoidable magnitude, we think would be liable to very great risks in times of heavy rain, or severe frost, notwithstanding the precaution of flood-gates; which, even if found efficacious, would, in a great measure, defeat the purpose of the sewer, by contaminating the water of the Thames.

Another difficulty regarding Mr. Martin's plan, is the quantity of sewer water that will require to be either evaporated, or run off, from the manure reservoirs. This quantity would necessarily be immense, and may be estimated by the quantity brought into London by the different water companies, or obtained from wells, &c., in addition to what falls from the clouds. If this water is neither evaporated nor run off, then the contents of the sewers must be conveyed in their present state to the grounds where they are to be employed as manure; but to convey all the water contained in the sewers of London in "covered barges, or properly constructed land-carriages," may be safely pronounced impracticable. We have no doubt of the utter impossibility of evaporating this water during the winter months, and, consequently during that season at least it must be run off. Mr. Martin has not stated how he means to dispose of it. It is certain that, if it found its way into the Thames any where above Gravesend, it would, from the influence of the tides, contaminate the water as far as London; and, if it remained in ponds in the neighbourhood of the reservoirs of manure, it would cover great part of the surface of the Essex marshes. The superfluous water, we think, would be best got rid of by running it off from the manure reservoirs into an open sewer, parallel to the Thames,

and continued as far as the sea, and then allowing it to escape among the sea-water, which is already unfit for human use. The salt seas, then, in every part of the world, appear to be the only natural cess-pools, or reservoirs, for the sewers of great cities; and, unquestionably, the only true principle of arranging the sewerage of all cities, towns, and even villages, which are built along the banks of rivers, is by forming sewers parallel to those rivers, and not so far from them as to occasion any difficulty in the sewers receiving the drainage of the space between them and the margin of the river.

If the building of London were to be recommenced, the first step should be to form two sewers parallel to the Thames, though at such a distance from it as to admit of forming docks, basins, &c., on its banks; but, as this has not been done, the question is (now that the ground is covered with houses and streets, and various docks, basins, and canals), how to remedy the evil? We are inclined to think it will be better done by two or three intercepting sewers, at different distances from the Thames, than by one so close to that river, and so large as that which Mr. Martin proposes. One sewer might be carried at about the distance of the Strand, more or less, as might be convenient; a second, about the distance of Holborn, which should intercept all the sewers between it and a third, about the distance of the New Road, which should, in like manner, intercept all the sewers northwards. The directions of these sewers must necessarily vary with the inclination of the surface, so as to keep the bottom of each sewer of one uniform declivity; and they might all unite in an open sewer, or ditch, a few miles down the river, which ditch might be continued to the sea, or to the point where the water of the Thames became decidedly salt. Where the sewer met with rivers or canals, it might cross beneath them in inverted siphons, such as those employed in conveying the water used in irrigation in Lombardy. Indeed, a considerable part of the water of this sewer, and, possibly, at some seasons of the year, the whole of it, might be employed in irrigation; in which case it should be raised from the sewer by machinery, impelled by steam, and conveyed to the fields intended to be irrigated by open ditches, or in pipes. By the latter mode, it might be conveyed many miles in the interior, even over a hilly country; and, perhaps, such a mode of irrigation would even now pay the British cultivator.

If intercepting sewers of the kind described were to be carried into effect in London, they might all be so deep under ground as to be excavated by tunneling; and, consequently, the surface, and the buildings on it, would be scarcely at all disturbed. The expense, also, of this mode of excavating sewers, we think, might be more readily ascertained than that of forming one immense

tunnel in Mr. Martin's manner; as it could not vary much from that of the present ordinary sewers. One obvious advantage of this mode of forming intercepting sewers is, that, by dividing the water to be conveyed away into different portions, there never could be any danger from the stoppage of a sewer, at all to be compared to that which would result from the bursting of one main sewer, which should contain the contents of all the sewers of the metropolis on one side of the river. Another advantage is, that, by having the intercepting sewers considerably deeper than the ordinary ones, there would be no occasion to stop up the ends of the ordinary sewers which crossed them; in consequence of which, if any intercepting sewer were at any time choked up, the superfluous water would readily find its way, through the ordinary sewer, into the next intercepting sewer, or, at all events, into that which was on a lower level. Again, a system of intercepting sewers would not interfere with any of the docks, or with the canals which join the river, which the scheme of a single sewer adjoining the Thames, we think, would certainly do.

If such a system of sewerage were formed on the intercepting principle, or, indeed, on any other, to be effective in preserving the purity of the water of the Thames, it must be commenced above Brentford, or rather, perhaps, at Oxford, and continued, at least, for some miles below Gravesend. Wherever the sewer did not pass through towns or villages, it might be an open ditch; and it would form, during its whole length, a valuable source of liquid manure to the adjoining lands. Of course, it could easily be carried under rivers, streams, or canals connected with the Thames, by the mode already suggested; and such proprietors as chose might have a covered ditch instead of an open one. Other proprietors might have iron pipes, even though they lived at several miles' distance, communicating with the sewer; and, by applying pumps to these pipes, they might obtain water for the purposes of irrigation at pleasure.

We shall, perhaps, surprise our readers when we state, as our candid opinion, that we do not think the "magnificent promenade on each side of the river, to be formed by the conversion of the roofs of the colonnaded wharfs into parapeted walks," would be at all desirable. A quay, or broad terrace walk, along the banks of the river, we think, would be highly so; but to stop up the ends of the streets by this colonnade, and its parapeted roof, would, we think, prevent their proper ventilation; and we are sure that it would totally destroy the beautiful views of the river, now obtained by looking down them; which views, in a large city, more particularly in summer, are peculiarly refreshing to the sight, from the idea of coolness conveyed by the vast expanse of water, as contrasted with the dust and heat of the

streets. Were such a colonnade and public walk executed, there can be no doubt it would produce a very grand impression at first sight; but by no means so much so as might be imagined. This, a little reflection will convince any philosophic architect, must necessarily arise, from the circumstance of its ground plan having neither regularity nor symmetry; that is, of its consisting neither of one or more straight lines, nor of one or more regularly curved lines, nor of such a combination of these as would suffice to form a symmetrical whole. In the absence of both regularity and symmetry, the monotony of the impression of grandeur would, we think, soon become wearisome. In proof of this, we may refer to the elevations of the houses in the streets on the banks of the Spree, at Berlin; to those on the banks of the Neva, at St. Petersburg; and even to those on the banks of the Arno, in some parts of Florence and Pisa. If, instead of the proposed colonnaded quay, we had only an architectural basis, such as would be formed by a river wall, like those in the cities mentioned, and a broad promenade within it, we should, in the elevations of the houses facing the river, greatly prefer the variety that would be produced by the mixture of public and private buildings, by the different purposes for which both were erected, and by the wealth, taste, and even no taste, of the erectors, to any regular design whatever. In short, we are of opinion that Mr. Martin's colonnade, grand and sublime as we allow it to be, if executed on either, or on both sides of the Thames, would take away half the interest and variety which at present attaches to that river. To enable our readers to judge for themselves, we shall present them with an engraving, a fac-simile of the perspective view which accompanies the *Report*. In this engraving (*fig.* 142.), *a* is the grand sewer; *b*, the roof to the sewer, forming the wharf; *c*, the old quay; and *d*, the public walk.

By adopting the principle of having sewers parallel to all rivers and streams throughout the whole of their course, every particle of manure, and more especially of liquid manure, would be saved. In thinly inhabited countries, sewers of this kind are out of the question; but in such as are densely peopled they seem to be absolutely necessary for the preservation of the purity of the water of the rivers. There must, we think, be something radically bad in the geographical police of a country, in which not only the water of all the rivers is more or less polluted, but in which an immense quantity of the most valuable description of manure is habitually and irrecoverably lost.

If a system of intercepting sewers were adopted, extending from Brentford or Windsor to Gravesend, there could be no difficulty in supplying London with pure water from the Thames. If, on the other hand, the system of making all the rivers of a

country serve as its main sewers, as is at present the case, not only in Britain, but throughout the world, is to be persevered in, it may be reasonably pronounced impossible ever to obtain perfectly pure water in large quantities in densely peopled countries; since every part of the rivers of such countries must contain more or less of those fæcal impurities, which, according to Dr. Granville (see p. 365.), neither subsidence nor fermentation will remove.

With this view of the subject, we do not approve of Mr. Martin's plan of forming a dam across the Thames, and supplying the metropolis from the water above it; for though we admit that this water is much more pure than that of the Thames opposite London, yet still it would contain all the impurities of Brentford, and the tributary sewers from the intervening villages. Mr. Telford's plan is not without objections of the same kind: in short, there is no plan by which immense quantities of perfectly pure water can be obtained in a densely peopled country like England, but by preserving the purity of the rivers by intercepting sewers, or by raising the water from inferior strata, in which there may prove to be an abundant supply. When we consider the advantage that would arise from saving and applying to the surface of the soil the immense quantity of liquid manure now utterly lost, and, at the same time, the desirableness of having pure water in all large cities, we cannot help thinking that the subject of intercepting sewers deserves the attention of government, and of the proprietors of lands in the country, no less than of the dwellers in towns.

Mr. Martin's plan for a parapeted public walk by the side of the river is magnificent; but, as we have already stated our objections to the proposed structure, it is unnecessary here to add anything more respecting it. An uncovered parapeted quay, like that which borders both sides of the Neva, at St. Petersburg, we should wish to see carried along both banks of the river; and this, besides facilitating business in business hours, would form an excellent promenade in the evenings, and on Sundays.

In the year 1829, in consequence of an attempt made in parliament to procure a bill for enclosing Hampstead Heath, our attention was directed to the subject of public walks and breathing places; and the following is an extract from an article which appeared in the *Gardener's Magazine* for that year: —

"A late attempt in parliament to enclose Hampstead Heath has called our attention to the rapid extension of buildings on every side of London, and to the duty, as we think, of government to devise some plan by which the metropolis may be enlarged so as to cover any space whatever with perfect safety to the inhabitants, in respect to the supply of provisions, water, and

fresh air, and to the removal of filth of every description, the maintenance of general cleanliness, and the despatch of business. Our plan is very simple; that of surrounding London, as it already exists, with a zone of open country, at the distance of say one mile, or one mile and a half, from what may be considered the centre, say from St. Paul's. (*fig.* 143.) This zone of country

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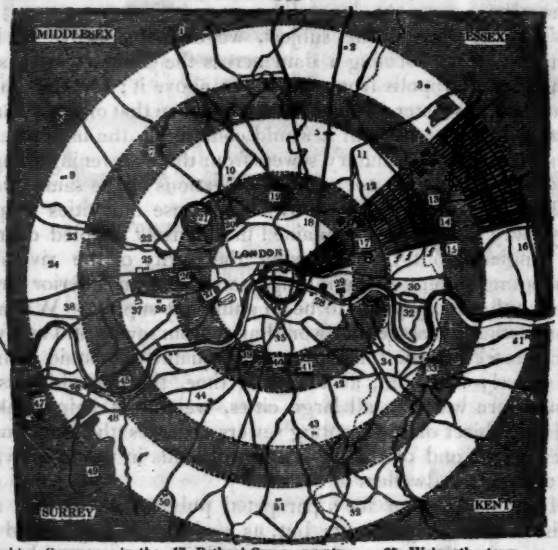

1. Finchley Common; in the zone of country.
2. Tottenham; in the zone of town.
3. Walthamstow; town.
4. Forrest House; town.
5. Stoke Newington; town.
6. Highgate; country.
7. Hampstead; country.
8. Kingsbury; country.
9. Wiladon; town.
10. Kentish Town; town.
11. Clapton; town.
12. Hommerton; town.
13. Stratford; country.
14. West Ham; country.
15. West Ham Abbey; country.
16. East Ham; town.
17. Bethnal Green; country.
18. Hoxton; town.
19. Islington; country.
20. Somers' Town; country.
21. Regent's Park; country.
22. Paddington; town.
23. Paddington canal; town.
24. Six Elms; town.
25. Bayswater; town.
26. Hyde Park; country.
27. Green Park; country.
28. Southwark; town.
29. London Docks; town.
30. West India Docks; town.
31. Woolwich; town.
32. Isle of Dogs; town.
33. Greenwich Park; country.
34. Deptford; town.
35. Walworth; town.
36. Brompton; town.
37. Kensington; town.
38. Hammersmith; town.
39. Lambeth; country.
40. Kennington; country.
41. Camberwell; country.
42. Peckham; town.
43. Dulwich; town.
44. Clapham; town.
45. Fulham; country.
46. Putney; town.
47. Roehampton; country.
48. Wandsworth; town.
49. Wimbledon Park; country.
50. Tooting; town.
51. Norwood; town.
52. Sydenham; town.

may be half a mile broad, and may contain, as the figure shows, part of Hyde Park, the Regent's Park, Islington, Bethnal Green, the Commercial Docks, Camberwell, Lambeth, and Pimlico; and it may be succeeded by a zone of town one mile broad, containing Kensington, Bayswater, Paddington, Kentish Town, Clapton, Lime House, Deptford, Clapham, and Chelsea: and thus the metropolis might be extended in alternate mile zones of buildings, with half mile zones of country or gar-

dens, till one of the zones touched the sea. To render the plan complete, it would be necessary to have a circle of turf and gravel in the centre of the city, around St. Paul's, half a mile in diameter. In this circle ought to be situated all the government offices, and central depôts connected with the administration of the affairs of the metropolis. That being accomplished, whatever might eventually become the extent of London, or of any large town laid out on the same plan and in the same proportions, there could never be an inhabitant who would be farther than half a mile from an open airy situation, in which he was free to walk or ride, and in which he could find every mode of amusement, recreation, entertainment, and instruction.

"Supposing such a plan considered desirable, it could not, perhaps, be carried into execution in less time than 50 or 100 years, on account of the large sums that would be required for purchasing the valuable houses that must be pulled down to form the central circle of turf, and the first zone of country. But, were government to determine the boundaries of certain future zones, and to enact a law that no buildings now standing on the future zones of country should be repaired after a certain year; and that, when such houses were no longer habitable, the owners should be indemnified for them by the transfer of other houses of equal yearly value in another part of the metropolis, belonging to government; the transition (considering the alteration in the relative value of property which is likely soon to take place, in consequence of the numerous rail-roads, &c., now going forward,) would not be felt as the slightest injustice or inconvenience. Government would be justified in adopting a plan of this sort, from its obvious reference to the public welfare; and a committee appointed to carry the law into execution should begin by purchasing such lands as were to be sold in the outskirts of the metropolis, in order to be able, at a future period, to exchange them for lands destined to form the central circle of the first zone. "In endeavouring to give an idea of the situations of the zones round London (*fig.* 148.), we have drawn the boundary lines as perfect circles; but, in the execution of the project, this is by no means necessary, nor even desirable. The surface of the ground, the direction of streets already existing, which it would not be worth while to alter, the accidental situations of public buildings, squares, and private gardens, with other circumstances, would indicate an irregular line, which line would at the same time be much more beautiful as well as economical."

In judging of the remarks in this and the preceding page, it must be recollected that they were written in 1829.

MISCELLANEOUS INTELLIGENCE.

ART. I. *Foreign Notices.*

FRANCE.

THE following is a translation of a letter from M. Le Bas, Architect at Paris, Honorary and Corresponding Member of the Institute of British Architects, addressed to the secretaries of that body, and read at their closing meeting held on Monday, 18th July, 1836: —

Paris, 14th July, 1836. — I have received your letter, and in reply I hasten to give you as succinct an account as possible, not only of the details of the late fire at Chartres Cathedral, but also of the new public buildings which are now in course of completion in our capital.

The Accident at Chartres appears to be much less serious, in as far as regards art, than was at first imagined. It was occasioned by the negligence of a workman engaged in repairing the timber-work of the roof; and who left there a brasier full of lighted charcoal, some sparks from which were carried by the wind among the carpentry. The workman, on his return, finding that the wood had taken fire, thought he could extinguish it himself, and neglected to call for help till it was too late to stop the progress of the flames, which spread with extreme rapidity, till the whole of the timber-work of the grand nave was reduced to ashes. The lead that covered the roof melted, and ran down on all sides; and the half-burnt beams sank on the vaulted stone roof, where they continued to burn till they were quite consumed, without any other injury resulting to that part of the building than what arose from the calcination of 2 in. or 3 in. of the upper surface of the stone. The clock, which was in a tower, was melted; all the wood-work that supported it was burnt; and the interior of the tower considerably damaged. Happily, the magnificent works of art contained in the cathedral, both in sculpture and painted glass, have not only escaped serious injury, but were wholly untouched. The damage done to the cathedral is thus confined to the destruction of the carpentry of the roof, and the melting of the lead; the expense of repairing which is valued at about 800,000 francs (3200*l.*). The repairs have already commenced; and when they are finished it is probable that the edifice will be found to have gained, rather than lost, by the accident; since for a heavy wooden roof, badly put together, one of iron will be substituted; which will not only be superior in point of art, but will be a guarantee against the recurrence of a similar misfortune.

The Public Buildings of Paris. — I am not surprised to find so much interest felt in England respecting the erection and reparation of our public buildings; as the natural consequence of the increased intimacy between the two nations is, to make us reciprocally appreciate the merits of each other. Thus, while we admire the enterprises for the advancement of commerce and public utility, which are so frequently undertaken in England, you envy the splendour of our edifices, which all the arts are called in requisition to embellish. If you are more practical, we are more brilliant; and this may be traced to the difference of situation, and of character, in the people of two nations, to both of whom the noble mission has been delegated of enlightening the world.

The principal public buildings, the finishing of which is carrying on with the greatest rapidity by government, are: 1. The triumphal arch at the Barrière de l'E'toile; 2. The Church de la Madeleine; 3. The Pantheon; 4. The Museum of Natural History; 5. The Basilico of St. Dénis; 6. The School of the Fine Arts; 7. The hotel for the Ministers of the Interior, &c., on the Quay d'Orsay; 8. The monument commemorative of the events of July, 1830; 9. The College of France; and, 10. The fixing of the Obelisk of Luxor; without mentioning numerous works of less importance.

The works to be completed out of the civil list are: The Museum at Ver-

sailles, and the restoration of the paintings, and of the furniture and fittings up, of the apartments in the Château of Fontainebleau.

The works in progress which have been undertaken at the expense of the city of Paris, are: 1. The church of Our Lady of Loretto; 2. The prison for the reformation of young culprits; 3. The prison for adult criminals; 4. The embellishments of the Place de la Concorde; 5. The reparation and enlargement of the Hôtel de Ville, and the Palais de Justice; besides many other works, more or less important, but which have all for their object public convenience, and the embellishment of the city.

The Triumphal Arch at the Barrière de l'Etoile. — Of all these great works the triumphal arch is the only one which is nearly completed; and even this wants the piece of sculpture which ought to crown its summit, but of which the design is not yet determined on. This arch will be opened to the public on the 29th of this month, on the occasion of the fête of the Three Days of July. It is ornamented with numerous works of sculpture and statuary, of a scale proportioned to that of the arch; that is to say, of colossal dimensions. A bas-relief, 130 mètres in length (above 400 ft.), occupies the frieze of the entablature; and six large bas-reliefs, and four smaller ones, decorate the interior and exterior surfaces. In the spandrils of the large and small arches are twelve figures in bas-relief, which fill the angles that are formed; and four colossal trophies, in alto relievo (the allegorical and historical figures contained in which are near 20 ft. high), are placed against the piers which support the arch. A sum of 120,000*l.* has been employed in the completion of this edifice.

The Exterior of the Church de la Madeleine is entirely finished. It is of the greatest magnificence, not only as regards its architecture, but from the rich ornaments and bas-reliefs with which it is decorated. The interior of this temple, which is one of the grandest known, corresponds, in the splendour of its arrangements and its decorations, with the richness of the exterior. To give a complete description of this, and the other buildings of which I shall have occasion to speak, would be much too long: I shall therefore confine myself to telling you, that all the parts are alike brilliant with paintings, sculpture, gilding, and the most beautiful marbles; all distributed without profusion, but also without any appearance of parsimony. The sum expended on this edifice, during the last three years, amounts to 132,000*l.*

The Pantheon. — 60,000*l.* have been devoted to the embellishment of the Pantheon. Already this noble edifice has been surrounded with a palisade, on the pedestals of which are superb candelabras of bronze. Three large gates, enriched with ornaments and bas-reliefs, have been executed in bronze; as has, also, a colossal statue of Immortality, which is to be placed on the summit of the dome. Bas-reliefs have been affixed to the tympanum of the pediment, and under the peristyle of the temple, to decorate the exterior; and, interiorly, our celebrated painter, Gérard, has just finished paintings for decorating the four spandrils of the cupola. Fresh sums will be allowed for completing the other works. The tombs of Voltaire, Rousseau, and the Duke de Montebello have been suitably restored; and the different parts of this edifice will furnish a vast field for the future labours of the historical painter and sculptor.

Jardin des Plantes. — Immense works have been, and are still being, executed at the Museum of Natural History. When they are completed, they will have cost 114,000*l.* They consist, principally, in the erection of a range of new hot-houses, in the construction of a gallery for mineralogy and geology, in a building for the monkeys, and in a reservoir and pipes for the distribution through the garden of the waters of the Canal de l'Ourcq; also of some new buildings which are required by the professors.

Basilico of St. Dénis. — A sum of 60,000*l.* (which is not sufficient) has been employed in the restorations and embellishments of the church of St. Dénis; which is now rising from its ruins, and is every day becoming

more and more enriched with beautiful works in precious marbles, in mosaic, and in painted glass; besides which there is a magnificent organ.

The School of the Fine Arts has been very richly endowed: 80,000*l.* have been expended on it during the last three years. The works proceed with great activity and great splendour. The construction of the principal building, and of the right wing, is finished; the rich portico, in the form of a triumphal arch, obtained from the demolition of the Château de Gaitton, is restored; vast halls have been laid out on the different stories, for the pupils, the exhibitions or examinations, the libraries, and the museums. The ancient church has been restored; and it is destined to receive copies of the paintings in the Sistine Chapel at Rome, and casts of the tombs of the Medici at Florence, which the French government has had made.

Hôtel du Quai d'Orsay. — But what shall I say to you of the Hôtel du Quai d'Orsay, destined for the use of the Ministers of the Interior, and of the Public Works; on which, only from 1834 to 1837, there will have been expended 200,000*l.*? You may judge, by the importance of this sum, of that of the works. They are such, that I know not if they may not be reproached with having too great a prodigality of ornament.

The Monument commemorative of the Events of July, on the site of the Bastille, is not so far advanced as any of the others. It consists of a column of bronze placed on a surbase of marble, which serves as a fountain; and it is surmounted by a statue in bronze of the Genius of Liberty. The estimated cost of the erection of this monument is 36,000*l.*

College of France. — The restorations and additions of lecture-rooms, libraries, galleries of natural philosophy and of mineralogy, to the College of France, have cost 52,000*l.*; and this establishment, founded by François I., will now be worthy of its high destination.

The Obelisk brought from Luxor to Paris is to be erected, in the course of the next year, on the Place de la Concorde. The pedestal will be composed of five pieces of stone, of colossal dimensions; the extraction of which from the quarries at Brest was almost as great a labour as that performed by the Egyptians in removing the obelisk from the mass of sand in which it was buried. The means employed to transport the single stone for the base of the pedestal were equally simple and ingenious; and it is probable that those employed for the elevation of the obelisk will merit the same eulogium. The cost of preparing and erecting the pedestal of granite, and that of the steam-engine which is to raise the obelisk, are estimated at 22,400*l.*

Chamber of Peers. — Important additions are also making to the Chamber of Peers; and all the façade looking on the garden of the Luxembourg is about to be augmented by an addition, which will contain the hall for public meetings and its dependencies (*la salle des séances publiques, et ses dépendans*).

Versailles. — Of all the works undertaken by the Civil List, the most considerable are those at the palace of Versailles. The King has conceived the noble project of rendering this ancient royal residence useful, and of consecrating it to the fine arts, by forming it into a national museum. All the historical recollections which have been recorded by painting and sculpture, from the most distant period to the present day, are here collected together, and arranged chronologically, so as to present a series of memorable events and celebrated personages, illustrative of the history of France. To realise this project, it has been necessary not only to throw all the small apartments into galleries, and to search with infinite pains, and at a very great expense, for all the historical pictures, statues, and bas-reliefs now existing, but to order from French artists those which will be wanting to complete this interesting collection. The works, both of construction and art, of this great undertaking, are already far advanced; and it is estimated that they will cost 7,000,000 or 8,000,000 francs before they are entirely finished.

Fontainebleau. — It is with the same solicitude that the King, as protector of the arts, has saved from utter ruin the fine paintings in fresco at the Château

of Fontainebleau. All the works of art, executed in this palace in the fifteenth and sixteenth centuries, by the artists whom François I. and Henri II. invited to France from Italy, being in a deplorable state of degradation, able painters have been called in to restore them; and they have succeeded in doing so in the most satisfactory manner, by means of encaustic painting. The interior of this palace, now restored to its ancient splendour, displays the most imposing appearance, and confirms the tradition of the taste for the arts which existed in France at the epoch of its erection. Several millions of francs have been devoted to its restoration, and to the rebuilding or repairing of those parts which exhibited most symptoms of decay.

The administration of the city of Paris is not behind in this general movement. It has completed, or undertaken, immense labours; the details of which would far exceed the limits of this letter.

The Church of Notre Dame de Lorette is nearly finished; and the objects of art which are enclosed in it are almost innumerable. Twenty historical painters have been occupied, for several years, in retouching the paintings which it is decorated, the subjects of which are all drawn from the Bible, or the lives of the saints, to the number of nearly one hundred. The sculptor and statuary have also contributed to its decoration, both exteriorly and interiorly; and as a piece of architectural design it is extremely rich. The expense is 80,000*l.*

The Prisons for young culprits, and for old criminals, are distinguished by another character in art, consisting in the disposition of the cells, and in the plans for amelioration, both having the same object in view; viz. the physical and moral advantage of the prisoners. These two establishments have cost 200,000*l.*

The Embellishments of the Place de la Concorde, where two beautiful fountains are to accompany the obelisk of Luxor, like those in the Place of St. Peter at Rome, are not yet much advanced; but they are about to be prosecuted with activity, as are the projects for the restoration and enlargement of the Hôtel de Ville and the Palais de Justice; where our historical painters and sculptors will find numerous and fine occasions for exercising their talents. These divers works are estimated to cost 700,000*l.*

However incomplete you may find this account of the actual state of the works relative to our principal public edifices, it will suffice, I trust, to give you some idea of their importance; and, if I have omitted any mention of many works, and have not entered into more ample details, it is because I feared that my letter was already too long, and, above all, that it would not arrive in time to be communicated to your Institute. — *H. Le Bas.*

Art. II. *Retrospective Criticism.*

Errata. — The following are a few typographical errors in Mr. Bland's essays on the *Principles of Construction in Arches*, &c., which the reader is requested to correct with the pen: —

In p. 55. line 4., for "1, 2, 3", read "1′, 2′, 3′"; making the same alterations in the corresponding figures of the diagram (*fig.* 8.).

In p. 56. line 6., after the full stop, insert "Nos. 7, 8, 9, and 10. stood alone".

In the diagram p. 57., add to the end of the top line of extrados "1½", and to the end of the second line, "1½"; also shift the figures "½ and ½", on the scale, a division more to the right.

In the diagram p. 59., omit "*o*" on the centre perpendicular line, and "*k*" under the base line.

In p. 60. make the following corrections: — Line 7., for "extrades", read "extrados"; line 11., for "*fig.* 11.", read "*fig.* 12."; lines 12. and 14., for

"(*d b h*)", read "(*d b f*)"; line 12., for "*d b* and *h*", read "*d b* and *f*"; line 12. from the bottom, for "forces" read "focus".

In p. 206., last line, for "3½", read "4½".

In the diagram p. 211., insert "*g f*" on the base line.

In p. 212. line 26., for "dimensions", read "diminutions".

In p. 217. line 3., for "(*figs.* 86. and 87.)", read "(*figs.* 85. and 86.)".—*W. B.*

Art. III. *Queries and Answers.*

Books on Gothic Architecture.—What are the best for a student to collect, so as to form a complete series, comprehending all the different manners, and taking into consideration that rigid economy must be attended to by the purchaser?—*A. B. Plymouth, June* 2. 1836.

Writers on Perspective "do not appear to me to have laid sufficient stress upon the difference between the points of sight and distance being fixed, in contradistinction to their being settled at the will of the Artist." This remark occurs Vol. III. p. 191.; and I should gladly see it taken notice of by some of your able correspondents; I should also be very glad to see several other difficulties, not provided for in most of the works on perspective, made the subject of some papers for your Magazine; and, as there is great room for improvement in this delightful science, I think that these papers would be very acceptable to the generality of your readers. *Nicholson's Perspective* is the one I have used; but I should be glad to know what work, among the many, may be considered the best?—*A. B. Plymouth, June* 2. 1836.

Art. IV. *Institute of British Architects.*

June 20.—J. B. Papworth, V. P., in the Chair. The minutes of the last Meeting were read. Messrs. Hamilton and Mocatta, Fellows, and W. Smith, Associate, having attended for the first time since their election, were admitted members of the Institute by the President. The following nomination and recommendation for a new member having been approved by the Council, and signed by the Chairman, was read:—as Fellow, Robert Dennis Chantrell, Architect, of Leeds.

The following architects, pursuant to a recommendation of the Council to that effect, were elected Honorary and Corresponding Members:—Ithiel Town of New York, United States, America; Sebastiano Ittar of Catania, Sicily.

The following donations were announced as having been received since the last Meeting:—John Martin, Esq., impressions from engravings of Belshazzar's Feast, Fall of Babylon, Joshua commanding the sun to stand still, the Deluge, Fall of Nineveh, the Crucifixion, and descriptive catalogue. Monsieur Hittorff, Honorary and Corresponding Member, Annales de la Société libre des Beaux Arts, 8vo; and various pamphlets. Thomas Hamilton of Edinburgh, Fellow, Traité des Pierres Précieuses, par Brard, 2 vols. 8vo; Cours d'Architecture, par Daviler, 4to, 1696; Vitruvius Venetia, 1584; Vetera Monimenta, &c., fol., Rome, 1690; and various specimens of slates and stones. An exquisite model of Cossey Hall, the seat of Lord Stafford, executed by Thomas Dighton, Esq., was also on the table, sent by that gentleman, to be deposited in the collection of the Institution.

W. L. Donaldson, Honorary Solicitor to the Institute, read a paper on heraldry, and its connexion with Gothic architecture. The thanks of the meeting having been voted for this communication, and Mr. T. L. Donaldson, Honorary Secretary, having explained the arrangement and construction of the pavilion erected at Edinburgh, in 1834, for the "Grey Dinner," by Thomas Hamilton, Architect, of that city, the Meeting adjourned to the 4th of July.

In the course of the evening, the Chairman announced, incidentally, that on the 18th of July, that being the last meeting of the season, the Institute Medal would be presented by Earl de Grey (who would preside on that occasion) to Mr. Godwin, jun., for his prize essay on Concrete, read at one of the early meetings of the session.

July 4. 1836. — Charles Barry, V. P., in the Chair. Read, the minutes of the last Meeting. The balance in the Treasurer's hands appeared to be 247*l.* 19*s.*

Elected. The following gentlemen were balloted for, and declared to be duly elected as Associates: — Samuel Sharp, Architect, of York; Henry Appleyard, Architect, of Montagu Street, Russel Square.

The following letters, to the Secretary, and Institution, were read:—

"Sir, "Dresden, April 30. 1836.

"Your notification of the establishment of the Institute has given me great pleasure; and I thank you for the rules and regulations forwarded to me, conjointly with the questions relating to architecture. I wish much that the situation of the Academy of Fine Arts at Dresden were such as to enable me to publish those questions in German, for promoting, according to your ideas, enquiry and research among all the members of the profession; or to procure their insertion in a scientific periodical of my country. In default of these modes of giving them publicity, I have made a short extract from the rules, and procured its insertion in the State Gazette of Saxony; inviting architects and others to address themselves for additional information to me. I send some copies of this Gazette with this letter; and have the honour to remain, with gratitude and esteem,

"Sir, your very obliged servant.

"Gentlemen, "Milan, April 25. 1836.

"The consideration in which your Institute is deservedly held throughout Europe, no less than in Italy, makes me appreciate most profoundly the distinction which you have been pleased to confer on me by electing me your Corresponding Member. My gratitude is by so much the more lively, from the manner in which you were so kind as to communicate to me this election. The brotherhood which you offer me makes me feel how much I gain in being associated with you. On my part, I desire that I may correspond somewhat to the confidence which you place in me; and, although I may not be equal to the task, yet, if I can in any way be useful to you, I shall be gratified in so doing. I shall be truly fortunate if any opportunity offers itself of being serviceable to any of those who honour me with the title of colleague, should they be coming to Italy.

"Be pleased to accept, gentlemen, with this offer, the assurances of the profound respect and esteem with which I am

"Your obedient and devoted servant,

"Ferdinando Albertolli."

Donations. A letter to the Right Honourable Spring Rice, M.P., containing a Plan for the better Management of the British Museum, by Mr. John Millard; a portion of stone from the Hospital which formerly stood on the site now occupied by St. James's Palace, by Mr. George Godwin, jun., Associate; a Catalogue of the Corsi Marbles, deposited in the Radcliffe Library, Oxford, 8vo; Dr. Kidd's Catalogue of Works on Medicine and Natural History, in the Radcliffe Library, 8vo, by Mr. George Gutch, Fellow; an impression of a medal of Salisbury Cathedral, published at Salisbury, by W. L. Donaldson, Honorary Solicitor to the Institute.

Resolved, That the thanks of the Institute are due to the gentlemen above named for their several donations.

G. L. Taylor, Fellow, read a paper upon the underpinning in concrete, adopted by him in the store-houses at Chatham dockyard.

Resolved, That the thanks of the Meeting be presented to Mr. Taylor for the interesting statement given by him.

Mr. T. L. Donaldson, Honorary Secretary, then read a paper communicated by Dr. G. Reid of Edinburgh to the Society of Arts in that city, upon the Principles of Sound applied to Buildings, more particularly with reference to his Class-room. Mr. Donaldson also gave a description of an apparatus used at Paris for painting or cleaning fronts of houses; with a drawing furnished by M. Loewe, Architect, of Warsaw, then present.

The Chairman thanked M. Loewe, in the name of the Meeting, for the information communicated through the Secretary. Adjourned to Monday, July 18.

Monday, July 18.—Earl de Grey in the Chair. The minutes of the last Meeting were read. Henry Appleyard, Associate, attending for the first time since his election, was admitted by the President. The following gentleman was balloted for, and declared to be duly elected:—Robert Dennis Chantrell of Leeds, as Fellow.

A minute from the proceedings of the Council having been read, recommending Dr. Charles Henry Christian Lang of Sheffield House, Kensington, for election as Honorary Fellow by contribution, and the sense of the Meeting being taken thereon, the President declared Dr. Lang to be duly elected; and he, being present, was admitted, accordingly, an Honorary Fellow by His Lordship the President.

The following letters were read:—

"Gentlemen, "Berlin, June 2. 1836.

"The honour you have been pleased to confer on me by electing me an Honorary Member of your illustrious Society cannot be more duly appreciated than by me, who, owing to a longer stay in your country, have been enabled to form an adequate judgment of the activity of your learned bodies, and of the spirit of emulation excited by their influence upon the developement of human knowledge.

"You will, therefore, gentlemen, oblige me by accepting my most cordial thanks for having admitted me into your ranks, and by allowing me to add the enclosed works to your collections, as a small token of the high regard which I entertain for their founders, and for those who are increasing them by their contributions. "I am, &c.,

"Beuth, Counsellor of State."

"Royal Prussian General Consulate, 106. Fenchurch Street, July 18. 1836.

"Dear Sir,

"With the accompanying letter from Mr. Beuth, Privy Counsellor, and Director in the Ministry of the Interior at Berlin, I beg to transmit you the following works, which have been published under that distinguished patron of the arts; viz.:—

"1. Specimens of Designs for Manufacturers.

"2. Plans of Works actually executed.

"3. Specimens of Designs for Masons and Bricklayers.

"4. Specimens of Designs for Carpenters.

"These works are distributed gratis to all architects and builders in the Prussian monarchy; and essentially tend to promote knowledge and emulation.

"I think the Society of British Architects will be pleased to receive these publications as a small token of the high esteem in which they are held by those who have witnessed their great zeal and earnest desire to promote architectural science. "I have the honour to be, &c.,

"B. Hemelen."

The following donations were announced as having been received since the last Meeting:—Herr Kop of Dresden, a copy of his work on architecture,

folio. Academy of Fine Arts at Padua, copy of a work published by the Academy, containing the edifices raised by the reigning Princess; also, a work illustrating the new theatre lately erected at Parma. Thomas Campbell, Esq., Sculptor, a plaster cast from his marble bust of W. Burn of Edinburgh, Architect, Fellow. An anonymous friend, ten volumes of blank books, containing tracings, drawings, and sketches by Clerisseau and others; being a collection made for the purpose of professional reference: also, a volume of drawings of ornaments executed in plaster, by Mr. Rose, after designs by Chambers, Wyatt, Stewart, &c. Mr. Williams, bookseller, Murphy's Batalha, folio, plates, London, 1836. Messrs. Brayley and Britton, copy of their work, entitled "The Palatial Edifices of Westminster," 8vo, pl., London, 1835–36. W. S. Inman, Fellow, Report of the Committee of the House of Commons on Ventilating, Warming, &c., abbreviated by the donor, 8vo, London, 1836. Philip Hardwick, Fellow, a suit of 28 specimens of marbles to one size, labelled; 17 specimens of French stones, labelled; also a great quantity of other specimens, some labelled, and some not.

Resolved, That the cordial thanks of the Institute be presented to the several donors above named for their splendid additions to the collection and library.

A letter from M. Le Bas, Honorary and Corresponding Member (see p. 382.) was read, giving an account of the extent of the injury done to the Cathedral of Chartres by the recent fire; and particulars of the principal buildings at Paris now in course of erection, with statements of their cost during the last three years. A letter was read from Ignatius Bonomi, Esq., Architect, at Durham, respecting some alterations and restorations recently made in the cathedral of that city. Communicated by I. J. Scole, Fellow.

Resolved, That the thanks of the Meeting are due to Messrs. Le Bas and Bonomi for their interesting communication.

T. L. Donaldson, Honorary Secretary, read a paper on the Polychromic System, translated by Nathan Garrick, Esq., and revised by W. Hamilton, Esq.; being a continuation of the subject begun at the ordinary meeting of February 29.

Resolved, That the thanks of the Meeting be presented to Mr. Garrick and Mr. Hamilton for their kind assistance on the occasion.

The Secretary also read a translation from the French of a paper on a Composition of Asphaltic Mastic, used for covering roofs, terraces, and foot-pavements, at Paris, accompanied by specimens furnished by T. Hardwick, Fellow.

His Lordship the President then addressed G. Godwin, jun., Associate, to the following effect:—

"It becomes my pleasing duty, as President of this Institute, and as presiding on this occasion, to present to you that mark of approbation which the Institute has thought proper to bestow upon a work of yours. In January last, an essay was read upon the Nature of Concrete, which the Institute felt to deserve such a prize as it was in their power to offer. I find by the minutes of that month, that that essay proved to be by you; that 'the sealed letter accompanying the essay being opened, George Godwin, jun., recently elected, appeared to be the successful competitor.' It was thus awarded by those competent judges (men at the head of the profession), appointed to give an opinion upon it, without their being aware by whom the paper was written which they approved. I have great pleasure in being President this evening, when this prize is to be awarded, when their approbation is now to be conveyed, and in being the organ to convey their sentiments. For myself, as an unprofessional man, it would be presumptuous to offer an opinion of my own; but, when I find those who have passed their lives in this pursuit have awarded the prize to you, I think I may say, even as a nonprofessional man, that I have perused your essay with much interest and advantage to myself, my attention having been called to the subject of concrete on several occasions of considerable importance. I have very great pleasure, therefore, in being the organ of their approbation. I only trust that it will be of advan-

tage to your country; and that what we now offer you may be the means of stimulating others to follow the same career as yourself."

Mr. Godwin returned thanks for the honour which had been conferred upon him, and expressed his gratification at being the first person to receive a medal from the Institute; and that the recollection of that moment would accompany him throughout his life, and be a stimulus to the earnest and honourable pursuit of his profession.

His Lordship proceeded: — "Mr. Godwin has expressed to you with what pride and satisfaction he has received this tribute, the first in our power to confer on any individual on a similar occasion. He has not, perhaps, yet had the opportunity to look at the tribute which is offered: it is, indeed, a most beautiful production. The artist, Mr. Benjamin Wyon, I believe is among us this evening; and, as men accustomed to look at and examine such objects, I am sure you will all feel that it is a pride to give, a pride to receive, and a pride to have executed, such a work as this. I have once before presented myself to you upon an occasion similar to the present: it was this time twelve-months, to take my leave of you upon the conclusion of the session. I took leave, then, with feelings of great respect for an Institute recently formed, and for the marks of kindness and respect which I had experienced at your hands. I expressed a hope that the Institute might flourish: I am happy to say that hope has been realised. Our greater fame has extended throughout the world: I may say, at all events, throughout the more civilised parts of it. We have received numerous presents from all countries; particularly Italy, Germany, and France; many of which now lie on the table. We have augmented our numbers at home; we have men of talent amongst our members abroad. When I see, at the last meeting of our session, that we are favoured by the presence of Baron Dupin and other distinguished foreigners, who will carry home in report our condition, I think I may add that the Institute of British Architects, founded here, is beginning to take root and fructify in other parts of the world; and, when I have the pleasure of meeting you again, I have no doubt I may state that we have increased in fame, value, and importance.

"This is the last meeting of the present session. Many of our members will disperse, some to the east, some to the west. Let me ask of you to carry abroad with you an affectionate recollection of the Institute at home. Remember, what information you pick up, however trifling in itself, may become, in the aggregate, valuable. There is hardly a man of any observation who cannot bring home some pebble which may prove a valuable acquisition. Be kind enough to recollect us when over the hills and far away; and let us have the pleasure to hear the result of what you have collected during the recess.

"On a former occasion of being in the chair, I stated that, though there might be in me a want of head, there should be no want of heart. I have taken a deep sincere interest in behalf of the Institute; and I may state that, not only now, but whenever I can in the slightest degree be of use to you, I shall be most happy. I have done, during the course of the session, my little; and I find that we have not only increased, but are establishing a permanent footing in the metropolis; and, as I then stated, we only wanted to be *known*, to be duly *appreciated:* now we are known. When we appear again, I have no doubt we shall find our numbers, fame, and points of usefulness have been more fully appreciated, simply because they have become more known. I will no longer take up your time, but adjourn the meeting to the first Monday in December. I will not promise to be present. I myself may be (as I said just now of others), perhaps, over the hills and far away; but, believe me, my heart will be with you, and that most cordially."

P. F. Robinson, Vice-President, proposed a vote of thanks to his Lordship, which was unanimously carried.

Adjourned to Monday, the 5th December.